RAILROAD GAZETTE

FRIDAY, SEPTEMBER 20, 1878.

Bridge Specifications as Made in Holland.

[Translated for the Railroad Gazette.]

(*Concluded from page* 445.)

ART. IX.—WORKING OF THE MATERIAL.

Sec. 28. *Working in General.*—It is expressly ordered that the manufacture of all parts of the superstructure, the scouring from rust and scale, oiling, galvanizing, assembling and painting must be done in covered buildings, properly protected against the entrance of cold air or of wet weather. From this rule is excepted the erection on the piers and abutments.

Material brought to the place of erection must be placed on skids above water, and must be covered with tarred c'oths.

Sec. 29. *Working of Different Parts.*—Plates and other rolled iron or steel parts shall be carefully straightened and cleanly cut to exact lengths, so that the parts riveted together at their edges shall form plane surfaces, the joints of which shall be almost invisible.

Something may be allowed for the edges of the flanges, but within certain limits defined by the Direction of the road, while the longitudinal seams between the chord plates must be exactly planed and must meet each other very exactly.

All surfaces of iron or steel abutting sideways or lengthways must be faced to square angles, and must be carefully fitted.

The pieces of iron or steel must be placed in such a manner that the direction of the strain shall agree with the direction in which they are rolled.

Mathematical centre lines must be drawn on the plates, by means of scribers, so as to lay out exactly the surfaces to be faced and the centres of the holes.

All bending of bars or plates must be done warm.

Angles and other pieces must be bent over cast-iron forms. Cast-steel or iron pieces between which the rollers run, those for the fixed ends of the girders and the surfaces of the end supports to which the chords are attached must be exactly planed, so that an exact bearing throughout shall be secured. Rollers shall be perfectly smooth, exactly cylindrical and of exactly the same diameter. All cast steel for the end supports, as chairs, plates, rollers, after being cast, shall be forged thoroughly under steam hammers. Also the iron for these parts shall be thoroughly steam-hammered.

Iron and steel chairs, rollers, plates, etc., of the end supports shall be galvanized.

Bed plates shall be fitted into the head stones and shall be laid in cement.

Rail ties and planks on the channel irons shall be fastened with square-headed bolts, with hexagonal nuts. These bolts and nuts shall be galvanized.

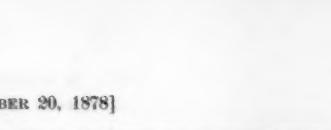
The bolt-holes in the wood shall be well coated with red lead color.

Sec. 30. *Rivets.*—Rivets must be carefully made according to the shape and dimensions of the approved drawings.

The heads shall be put on by the hammer; they shall be of regular shape and placed centrally upon the shanks.

The shanks must be straight and exactly cylindrical, with a slight increase under the head of one millimeter (1mm = $\frac{1}{25}$ in.).

The dimensions are as per accompanying sketch, the diameter of the shank being taken as the unit



Countersunk heads to which the form of a conical trunk must be given have $D = 1.05\ d$, and the height, H, of the trunk $= \frac{d}{2}$, where d is the diameter of the shank of the rivet,

D " " " base of the cone;
H " height of the countersunk head.

Sec. 31. As regards distances and distribution of rivets and bolts, also as regards connections, the contractor must observe the directions of the engineer in charge and the approved drawings. All connections must be made with all possible care and be as strong as it is possible to make them.

Sec. 32. *Rivets.*—All rivet holes must be drilled. Punching is not permitted. The holes must be drilled so as to have the exact diameter which is prescribed for the rivets. Boring to exact diameter, when the different pieces to be riveted together are placed one upon the other, may be done with a borer one-twentieth ($\frac{1}{20}$) larger in diameter.

The countersunk conical part below the head must be bored perfectly and cleanly around the holes in the plates and other parts.

The process of boring shall be a regular one for all parts. The bored pieces must be freed from fins on both sides, so that they will lie together closely.

Plates, etc., before being riveted together, must be clamped together firmly. To this end, in every rivet row, at least every third hole must be provided with a screw-bolt, which bolt, before the riveting of each rivet, will be screwed on tightly.

In order to test the dimensions of plates and the distance in the centre line of the holes, exact templets must be made whenever demanded by the engineer in charge. This especially holds good for connections of diagonals and verticals with the vertical chord plates. The different parts must match each other exactly; if not, the parts to be matched must be replaced by new ones.*

Angles, splice plates, etc., between the rivets must lie together perfectly and closely upon the plates, bars, etc., against which they are to be placed. Those parts in which this is not the case will be condemned.

In corners where good riveting is not possible, or where parts cross each other so that they must admit of some sliding, screw bolts, in the last-named case with oblong holes, must be used.

All riveting is to be done hot.

Iron rivets to be riveted must be made light-red hot, almost white, and the heads after being made must still show a dark-red heat when observed in the shade.

Steel rivets will be heated enough to admit riveting, and so as not to injure the quality of the material.

The rivets must be placed so that the heads and shanks fit closely.

The first blows with the hammer shall be given around the rivet while the rivet is pressed tightly against the metal.

The heads shall be well formed; they shall be full; they shall fit tightly, and shall have neither cracks nor splits.

The button-head tool shall never enter into the surface of the metal of the plates, etc., or else it would be proved that there was not enough metal to make the head, either because the iron was burnt away or because the rivet-hole was too large.

Both heads shall lie on the metal closely, and it must not be possible to enter any tool between.

Every rivet which has any of the faults mentioned will be chipped off at once, will be removed and replaced by another.

The number of condemned bolts or rivets will be carefully counted. If it is more than 1 per cent., for every tenth of one per cent. more the contractor will be fined to the amount of forty dollars, to be deducted from his contract sum.

The rivets shall be held against the iron by means of a cast-iron holder with clamp screws; the use of levers is not admitted, unless the approved tool could not be applied.

The riveting must be done with hammers and button sets.

The use of the small boiler-maker's hammer is not permitted.†

The weight of the hammer is regulated by the dimensions of the rivets, and shall be subject to the approval of the direction of the railroad.‡

Rivets with countersunk heads shall have their countersunk parts as full as possible.

In order to test resistance and the quality of the iron after riveting, the engineer shall have the right to cut out a number of rivets so as to furnish proof—

1. That the hole is filled as much as possible by the shank.
2. That the quality of material has not been altered.§

Sec. 33. Immediately after the examination and approval of the riveted parts all seams, etc., shall be filled watertight with suitable putty.

Sec. 34. All floor beams and stringers which are of the same shape and dimensions must be made to fit into cast-iron patterns, so as to get absolutely equal lengths.

Sec. 35. The expansion apparatus are of cast steel. The fixed part will be fastened to hard-stone blocks which are anchored to the piers. The stone blocks will not be furnished by the contractor.

ART. X.—EXAMINATION OF WORKMANSHIP.

Sec. 36. All parts having been straightened, cut to length and bored, before their being assembled will be subjected to an examination.

For this purpose they must be placed properly, so as to be examined all around. Any piece that has suffered from straightening, cutting to length, or from boring, which is in part objectionable, or does not prove to have integer sections, will be rejected and marked.

For any part, which was not subjected to examination, or which, being rejected, is worked into the superstructure, the contractor will be fined by a sum of $200, in addition to his duty of furnishing a new piece for the one rejected.

ART. XI.—ERECTION.

Sec. 37. The manner in which the contractor wishes to put together and erect the bridges must be approved by the Secretary of the Interior.

On these points the contractor explains his method at the time when he furnishes the drawings for the false works and machinery of erection.

The fitting, countermarking and placing of all corresponding parts must be done with the greatest care.

Sec. 38. The stringers, after removal of the blocking from under the finished main girders, may be riveted to the floor beams. Before this they may be attached by temporary bolts.

Sec. 39 refers to placing of false works in the river, which is navigable.

Sec. 40. *Over-Rolling.*—If the contractor chooses to roll parts of the superstructure over the false works, all precautions must be taken to avoid excessive strains in those parts. The friction rollers for the girders may not be used for this purpose. They will be placed only during the exact putting up of the bridge.

Sec. 41. *Camber.*—All bridges to be put up so as to have a certain camber, so that after removal of the false works and under a load of 2,250 kilos. per meter (1,500 pounds per lineal foot) the floor of the 100m opening will be just horizontal, and that of the other bridges have exactly the grade prescribed.

The camber to be calculated and provided for as per instructions given by the engineer in charge.

Sec. 42. *Riveting on the False-works.*—The putting together and riveting of the main girders, floor beams and other connections must be done so that those parts do not suffer. The work must be done so that no deformation shall take place, and that the lines and surfaces may acquire perfectly the shape given in the drawings.

The contractor is responsible for all faults and injury done during erection, and he must take care of all the details of the execution of the work.

Sec. 43. Thereupon the track shall be laid carefully and must be used for the testing of the whole bridge.

The contractor must take care to have a good connection with the tracks at the two ends.

He must lay the whole floor as per drawings.

The rails, fish-joints, bolts, spikes and washer-plates will be furnished to the contractor. He must give a receipt, after which he can send for this material to Utrecht.

ART. XII.

SEC. 44. (Refers to repairs of piers, etc., if injured by the contractor.)

ART. XIII.—PAINTING.

SEC. 45. All iron and steel, being cut to dimensions and being drilled, must be made free from all rust and scale by putting it into a bath of acid and water, in which it will remain as long as necessary.

Taken out with iron hooks and cleaned with water and brushes, it will at once be placed into a bath of lime-water, in which it will be turned and washed, whereupon it will be placed into a trough with boiling water, where it will be well heated. Iron and steel thus treated and taken out of the hot bath, immediately after becoming dry and while still warm, will be coated everywhere with hot linseed-oil varnish, and before this is dry the first coating or grounding will be given to those surfaces which in the shops will be closed up by riveting. Thereupon the riveting will be done, and then the rivet heads and all other parts must be given the first coating of color.

After erection of and opening and still before the placing of wooden ties and flooring, but not before the riveting in the field has been inspected and found satisfactory, all iron and steel for the second time will be coated with priming-color.

For the two coats of priming-color red lead or red oxide of iron, mixed thoroughly with linseed oil, must be used.

Painting must be done during dry weather, so as to be well done and free from blisters or spots.

All wood-work of the floors must be painted on the top four times with Russian tar, as ordered by the First Engineer.

The sulphate of copper for the ties will be impregnated under high pressure, after treatment of the wood by air-pumps; or else the wood must be boiled in sulphate of copper solution. The direction has the right to inspect and approve this process.

Sec. 46. *The Upper Coatings with Color.*—The colors will be prescribed by the engineer in charge. For this purpose the contractor will paint a part of the work in different ways, in order to select a proper color.

Lead colors will be used.

There will be four coats of coloring, to be given in the best manner and at such times as the engineer may direct.

With his permission the two final coats may be applied during the term of guarantee.

ART. XIV.—GENERAL TESTS.

Secs. 47 to 52. (Five engines with tenders, 50,000 kilos. each, followed by the heaviest freight cars 15,000 kilos. each, at a velocity of 22 miles an hour. No permanent set. Measuring of deflections with instruments furnished by the contractor but subject to approval by the engineer. Acceptance of bridge. Guarantee for one year, to be kept in repair by the contractor. His responsibility in every regard up to final acceptance, even if pieces, etc., should have been accepted before. Any bad work may still be rejected. The contractor, during the year of guarantee, keeps two watchmen, unless the bridge be opened for public use before the term of guarantee expires.)

ART. XV.—ADMISSION TO THE SHOPS AND WORKS.

Sec. 53. The Secretary of the Interior reserves the right to send engineers to the mill or shops for the inspection of manufacture.

If it should be found necessary, the contractor must erect work-shops at his place.

The government engineers or officers have free access at all times to the works or shops, in order to make the necessary tests, examinations, etc., and to assure themselves that the specifications are strictly adhered to.

The engineer in charge may, if he likes, make the tests at the place of erection.

The inspectors will be given a room on the manufacturer's premises, furnished and heated, with good light, and properly placed, to facilitate inspection, and provided with the necessary writing materials and paper.

The presence of the government engineers and officers at the shops of the contractor, and at the place of erection itself, the examination and tests, preliminary acceptance of material, both crude and manufactured, in no case shall diminish the responsibility of the contractor, which remains full and unimpaired up to the moment of the final acceptance of the work.

Pieces, though accepted at the works, will be rejected at the place of erection if any fault shall have been discovered.

* The general play or error in rivet distances admitted in European specifications is 1mm (1-25 in.) for a single distance and 2mm (1-12 in.) for a whole row of rivets. All centres must fall within two lines parallel and at distances of 1-25 in. from the centre line laid out; in other words, the play may never be more than 2mm in all.

† The use of riveting machines is not favored on the Continent of Europe. Riveting by hand is preferred and generally prescribed. The reason probably is this, that under riveting machines material is pressed between the plates.

‡ The upsetting hammers weigh 9 pounds apiece, the finishing hammers 16 to 18 pounds.

§ According to another specification it is prescribed to hammer especially made test pieces thoroughly around the rivets, when no head must fail.

Contributions.

Austrian Locomotive Boilers at the Paris Exhibition.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The locomotive boilers on some of the Austrian railroads have been for the last few years undergoing important changes in construction, owing to the difficulty they experienced in protecting them from corrosion, which seems to be the chief enemy of their boilers. New forms have been devised to overcome this difficulty and also to get efficient steam generators when the small coal (*menu*) is used for fuel. There is a general tendency in all the European countries to burn small coal wherever it can be had, and the use of it originated, I believe, in Belgium.*

The Austrian State Railroad Company exhibits a half-sized model of a new form of a fire-box, the novelty being in its crown (designed and patented by Mr. Ernest Polonceau), where the crown-bar or stay-bolts are entirely dispensed with. The objections to the old construction are: Taking up water space immediately above the crown, the bars being made heavy to sustain great strain, that they collect the scale, and thus reduce the evaporating space to 30 per cent.; the necessity of many holes in the crown sheets increasing the chances for leakage and the difficulty of making a good job; the difference of expansion between the bars, or bolts, and the sheets—which latter are of copper (but probably this is also the case when steel is used)—producing an unnecessary and injurious strain on the fire-box as well as on the boiler. The crown of the new fire-box, the model of which is of the style represented by fig. 1, consists of a series of plates, jointed transversely by means of flanges and rivets, as shown in enlarged views in figs. 2 and 3. The joints are either caulked or, in case of necessity, a thin strip of copper is inserted between the flanges to render them perfectly tight. It is evident that these flange-joints, placed at equal and calculated distances, give to the crown the necessary strength to resist the strain on it. On the sides of the boiler, and opposite to each of the sections constituting the crown, are hand-holes, making the cleaning of a sheet, free from all braces a very easy matter. Fig. 3 represents a cross section of the joint at the centre, and fig. 2 a cross section of it at the place where the side sheet flanges against it. The black strips between the flanges represent copper. Figs. 4 and 5 represent two of the several modifications of this fire-box—which are exhibited in drawings—and from them it will be seen that vertical braces from the crown of the fire-box to the outside crown can be easily made. These braces should never be dispensed with, their

* Witness the last letting of coal for the Belgian State Railroads (Sept. 5), when out of 153,600 tons for locomotives for which tenders were solicited, 96,000 tons were to be *menu*.

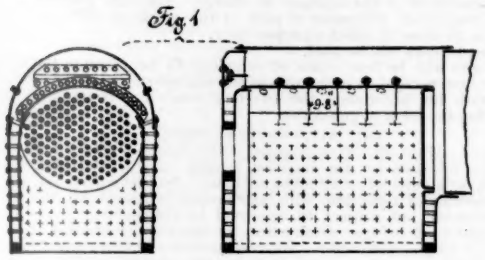
object being not only to strengthen the crown-sheets, but also to relieve the stay-bolts and rings of the fire-box from the downward strain, which the steam pressure necessarily exerts on them. Fig. 5 shows a modification, where the crown is flat, a preferable arrangement on account of admitting a larger number of flues, which, on the short American boilers, is a rather important matter; the extra sheet inserted between the flanges (fig. 5) seems to be superfluous.

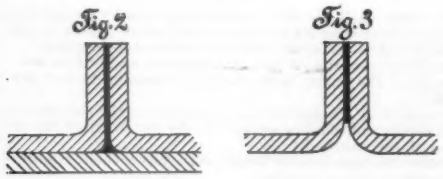
The advantages that are claimed for these fire-boxes are: easier maintenance and greater durability on account of the absence of all rivets and bolts in the crown; better evaporation on account of the greater heating surface of the crown being free and in contact with a larger quantity of water, and facility in maintaining the crown-sheet free from incrustation.

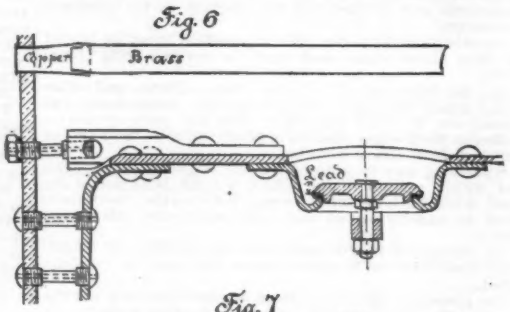
sheet, which, being made weaker at the centre than in any other part of the whole brace, is first to give way, and the fact is thus immediately discovered from the leakage that takes place, and the stay-bolt is replaced. The mud-dome, or pocket, is of sheet iron, pressed into the form shown in fig. 6 by a hydraulic press, and is kept from leaking by means of a leaden ring, placed under the cover, which from time to time is renewed at small cost. This mode of tightening the joints is preferred to the use of mastics, and is applied in other parts where the same effect has to be produced.

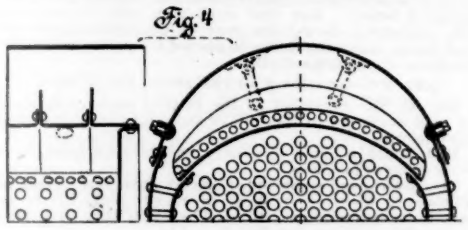
Experiments are now being made by the Austrian State Railroad Company to protect the boilers from corrosion by coating them with lead, a new process patented by Mr. A. Oehme. So far it has been applied only on the lower cylindrical portion (fig. 6) of the boilers of two locomotives, and

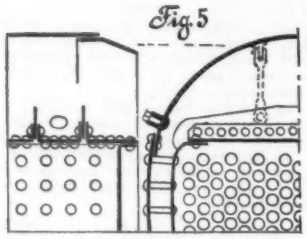
part of the whole was movable; but experience has taught that an inclined grate with a movable portion, which we call a drop-plate, is preferable (see fig 8), and the new locomotives are provided with such. A shallow fire-box has also been found to be advantageous, and the distance between the lowest row of tubes and the grate was shortened. The bars of the drop-plate are of cast iron, 0.78 in. thick, with a free space between them 0.63 in. wide; the bars of the stationary portion of the grate are only 0.39 in. thick, and the free space between them varies from 0.63 to to 0.39 in. in width, for the coal from different localities. The sparks, more or less ignited, are carried to the smoke-box, and to prevent them from being inflamed anew a perforated copper pipe, communicating with the water space of the boiler, is placed across the smoke-box (fig. 8), so that in case of need water can be discharged to extinguish the flame. The

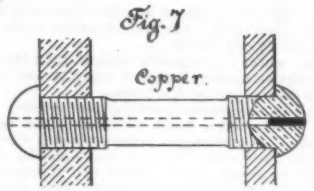


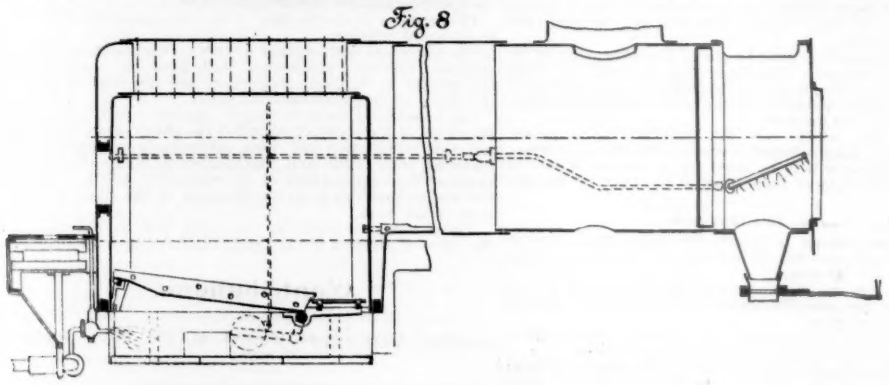


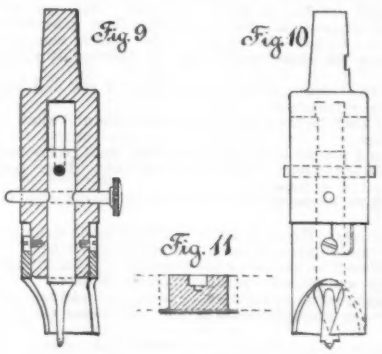


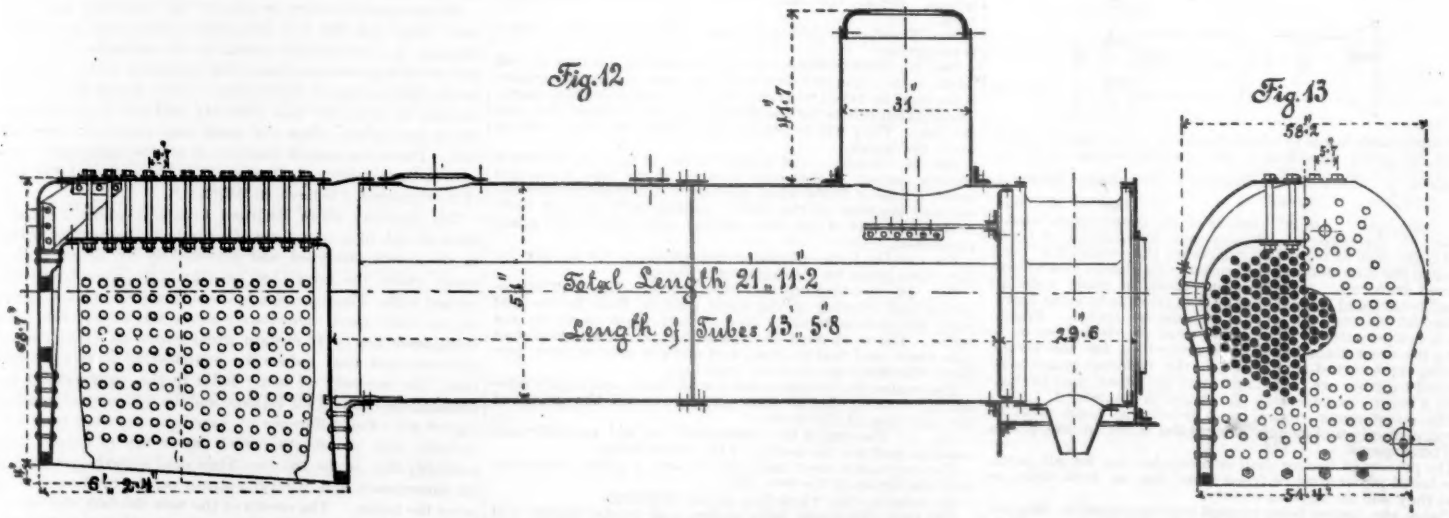












The fire-boxes are usually made of copper, also the smoke-box flue heads. The latter, when made of iron or steel, were subject to rapid deterioration, when small coal was used as fuel. The tubes are always of brass, 2.05 in. in diameter, and fitted with copper ends, about 5 in. long, at the fire-box end; they project about 0.3 in. from the tube-plate, and are beaded over. Stay-bolts of steel and iron having been tried with bad results, copper has been adopted, and special provision has been made to facilitate the discovery of any fracture. This is accomplished by perforating the stay-bolts with holes, about $\frac{5}{32}$ in. in diameter, and, after placing them in position, plugging up the holes from the outside (fig. 7), so that any leakage caused by a fracture will show itself inside of the fire-box.

The bracing of the portion of the tube-plate between the lowest row of the tubes and the upper row of the stay-bolts has presented some difficulty; the difference in expansion between copper and iron, or steel, causes the breaking of braces, and, it being important to discover such an accident immediately, various devices have been tried, until the arrangement shown in fig. 6 has been successfully applied. A brace is riveted to the cylindrical portion of the boiler, and a perforated stay-bolt is screwed into it and into the tube-

some of the worst parts, like mud-pockets, of a few others, and the results are not yet reported. Each sheet, and each piece, is coated separately, and the joints are brazed by the use of a blow-pipe.

A new tool for boring holes in the tube-plates is also exhibited by the same company, and is represented in the engraving by figs. 9 and 10. Formerly a small hole was punched, which served as a guide for a tool that afterward enlarged the hole, which was a slow and costly operation. The new cylindrical tool cuts only a ring around the centre (fig. 11), the operation taking 10 to 14 minutes, according to the nature of the material. Its construction will be understood from the engraving.

Since 1873 the company has begun to use small coal as fuel, steadily increasing its consumption until 1877, and from that time using it exclusively. The boilers had to be designed to suit the new fuel used, and it was found that the most essential condition is to provide them with large fire-grate areas. This is very evident, as only a thin layer of small coal can be spread on the grate bars, in order to let the air pass above it. The layer of fuel is usually from 3 to 8 inches thick, according to the quality of coal used by the company. Formerly the grate bars were horizontal, and no

bottom of the smoke-box has a cinder-collector with a sliding plate to discharge the cinders or small coal that may get into it. The ash-pan is provided with doors at the sides, and has also pipes communicating with the boiler or injectors, through which water can be admitted to prevent the ignition of coal that falls from the grate-bars. The fire is fed with coal completely wet with water, frequently, but in small quantities. When speaking of Austrian locomotives, I shall give the sizes of their grates and the other dimensions of their boilers.

Regarding the material employed in the construction of boilers by the Austrian State Railroad Company, it has been already stated that the fire-boxes, with stay-bolts, and the smoke-box tube-plates are of copper; the copper used is required to offer a resistance of 24 kilograms per square millimeter (34,063 lbs. per square inch), and permit an extension of 20 per cent.

The tubes are of brass, composed of 30 per cent. of zinc and 70 per cent. of copper. The company has 215 boilers of Bessemer, Martin, or cast steel; they corrode as much as those of iron, and some parts of them have to be replaced after three or four years of service. Experience has taught the company that a material of a very homogeneous character

and one that will not harden, is wanted, and they believe they have obtained it in the steel manufactured by the Martin process at their own works, at Reschitza; the tests made with it—the results of which are given in the following table—show a great resistance and sufficient ductility to obviate a sudden breaking.

STRAIN APPLIED.	In the direction of rolling.			Perpendicular to the direction of rolling.			Average.
Thickness of plates in inches	0.47	0.63	0.79	0.47	0.63	0.79	.....
Ultimate resistance in pounds per square inch	75,506	85,158	71,816	75,080	66,139	72,242	74,229
Extension in per cent. of the original size...	16	20	19	18	20	22	19
Sectional area of fracture, in per cent. of the original	37	44	43	41	44	47	43

The Emperor Ferdinand Northern Railroad exhibits two boilers; the one represented in figs. 12 and 13 is for a six-wheel coupled locomotive, and, being of the latest design adopted by the company, represents fairly the progress they have made in boiler-making. The great length of flues, 13 ft. 5.8 in., is what will strike the American constructor at first; this is not, however, the outside limit, and flues of 15 feet or more, can be met with in Europe. The advantage which was thought to be obtained from a very large heating surface, owing to the high temperature of the gases escaping through the chimney, has been, I believe, the principal cause of making long flues; but the plan of the locomotives, namely, the placing of all the axles under the cylindrical portion of the boiler, has been, and still is, another prominent cause. The great objection to long flues, and consequently long boilers, not to speak of the more frequent repairs required, is the great increase of the weight of the locomotive, and the overhanging of the same, unless longer wheel bases are adopted—which would add to the difficulty of running on curves. The tendency in Europe now is to shorten the boilers and increase the direct heating surface, as well as the fire-grate area. This change was brought about by the need of more powerful locomotives, limiting their weight, however, and yet not diminishing the speed of the trains. It was necessary to have a light boiler of a high steaming capacity. American boilers seem to excel all others in that respect; but this is done at more or less expense for fuel. Leaving aside this question, so difficult to determine for the lack of some well conducted experiments that would finally decide whether this or that is the best to adopt, and examining the construction of the boiler above mentioned, we will notice that the cylindrical portion of it consists of only two sheets, jointed together, not by being flanged one on another, but by a separate outside ring or welt, to which each of the sheets is riveted by a double row. The smooth inside surface decreases somewhat the corrosion of the lower portion of the boiler, and the ring adds to its strength. The construction of the fire-box has been patented by Mr. L. Becker, Central Inspector of the company. As seen in fig. 13, it has the corners of its crown-sheet bent in a circular form of quite a large radius, leaving but a small portion of it flat. The crown-sheet of the fire-box shell is flattened on the top, making the bracing of the two crowns with bolts an easy and good job. The advantages claimed for this arrangemet are: A decrease of the weight, as all crown-bars and other braces are dispensed with, and only few rows of bolts are required (the saving in weight is given at 880 to 2,200 lbs.); cheapness of construction, on account of its simplicity; better circulation of water on the top of the crown, and thus the partial prevention of the formation of scale; facility of cleaning of the crown; increased quantity of water, and through this a better preservation of boiler-plates; relieving the stay-bolts, fire-door and foot rings from downward pressure on account of the joining of the two crowns with bolts. It is also claimed that a larger fire-box can be made with less overhanging weight, and that the boiler can be increased in diameter, as the upper part of the box can be made wider. Finally, it is said that the advantages named have permitted a very powerful and comparatively light locomotive to be constructed with 1,615 square feet of heating surface, and but 77,000 lbs. of weight. Another boiler, exhibited by the same company, is for a switching locomotive; its cylindrical portion is constructed the same as that of the other, and the fire-box crown is of a semi-circular shape, without any braces or bolts whatever. The grate bars on all the locomotives on the Emperor Ferdinand road, are of a uniform type, and consist of rolled iron bars, whose cross-section has nearly a triangular shape, with no heads or joints at the ends of the bars, thus increasing the free space of the grate.

As to the material used in construction of boilers, preference is given to Bessemer steel, and as long as 13 years ago the Emperor Ferdinand road, at the suggestion of Mr. Becker, commenced trials with the new metal, and immediately employed it largely in construction of boilers, tires and axles. The demand for more powerful and not too heavy locomotives in 1864 drew the attention of Austrian engineers to some stronger material than iron. Since then the use of Bessemer steel has been daily increasing, and especially in England, where there is one company possessing more than 800 boilers made of it. The Austrian Northern Railroad has at present among its 326 locomotive boilers, only 33 wholly of iron (only two of them were built since 1865), 274 of steel, 16 with steel fire-box shells and iron cylinders, 3 with iron fire-box shells and steel cylinders. The fire-boxes are usually of copper, only six of Bessemer steel and one of steel-plated iron. Eighteen of the boilers were built of Krupp's crucible steel, in 1865–1866; there are now 13 cylinders and 17 fire-box shells left of them. The following table gives the comparative value of iron and steel as material for boilers:

YEAR OF CONSTRUCTION OF THE BOILER.	1865.		1866.		1867.	
	Iron.	Steel.	Iron.	Steel.	Iron.	Steel.
Per cent. of plates; the total number of plates replaced by new.....	30	63	29	25	25	14.6
Average strain exerted in lbs. per square inch	4,116	7,224	4,726	7,806	5,407	6,969
Average run of one locomotive in miles until the end of 1865.	130,820	163,517	109,923	153,514	122,561	147,254

The high percentage of steel-plates exchanged on boilers constructed in 1865 is due to their being made of Krupp's crucible steel. The other figures speak decidedly in favor of Bessemer steel.

The boiler-plates, before being made use of, are tested; Bessemer steel has to endure a strain of 66,700 lbs. per square inch, and an extension of 15 per cent. of its original length, before reaching the ultimate limit of strength; tests in bending it cold or hot are also made, in order to learn all the properties of the material. When the quality of the metal has been ascertained, the surfaces of the plates are examined, and all the scale, that may be pressed on in the process of rolling, is got rid of, and the side which is damaged most is placed on the outside, where it is not so much exposed to corrosion. In working the plates into a shape, care is taken that the whole has a uniform and not too high a temperature; and if only a part of the plate has to be heated, the work is executed with the greatest care. Only wooden mallets are used, and the work prosecuted not longer than the heat is visible. All the rivet holes are bored.

In the design care is taken that the boiler be composed of the smallest possible number of pieces, and thus the system spoken of in the description of the boiler exhibited is adopted. The boiler rests on frames in two places only: at the fire-box, where provision is made to allow for expansion, and at the smoke-box end, where the joint is fixed; all bracing between these two points was found to be more injury than advantage. Every boiler is inspected on its outside once a year, and on the inside every five years, or after a run of 148,800 miles from the time it was built; then in four years, or after a run of 99,200 miles; at which time the time for the next inspection is decided. The law requires the boilers to be tested when they are new, and every five years thereafter, or, in case more than one-twentieth of the total surface of the boiler has been renewed. There are exhibited at Paris tables of dimensions, drawings of details, rules for inspection and other interesting data concerning the boilers of the Emperor Ferdinand Northern Railroad.

Train Accidents in August.

The following accidents are included in our record for the month of August:

REAR COLLISIONS.

On the night of the 1st a freight train on the Wabash road ran into a car, which a high wind had blown from a siding upon the main track at Homer, Ill., wrecking the engine and some cars and blocking the road some time.

On the night of the 5th a coal train on the Lehigh Valley road ran into the rear of a preceding coal train near Bound Brook N. J., wrecking several cars and scattering the wreck over both tracks.

On the evening of the 7th a freight train on the Boston & Albany road ran into the rear of a preceding freight, which had stopped on the main track in Pittsfield, Mass., wrecking two cars. It is said that the first train did not send back any signal.

On the afternoon of the 8th, as a passenger train on the New York & Manhattan Beach road was making a flying switch at Manhattan Beach, N. Y., the switch was not closed soon enough, and the cars ran upon the siding and into the engine, doing some damage and injuring four passengers.

On the morning of the 9th a passenger train on the Chicago, Burlington & Quincy road ran over a misplaced switch and into the rear of a freight, which had just gone upon a siding at Riverside, Ill. Two freight cars were wrecked, the engine and a milk car on the passenger were piled up and badly broken. The fireman was caught under the engine and burned to death, the engineer, two brakemen and the baggageman badly hurt.

On the morning of the 20th, as a freight train on the Manchester & Lawrence road was being run on a siding at Methuen, Mass., the brakes failed to hold it, and it ran into some cars on the siding, wrecking several of them and injuring a brakeman.

Very early on the morning of the 22d the third train of a convoy of freight trains on the Kansas Pacific road ran into the second, which had stopped for water at Manhattan, Kan. Several cars of the second train were damaged, and the train forced forward against the rear of the first one, which had also stopped, damaging the second engine and several cars. It is said that the engineer of the third train had been on duty for 36 hours, and that he was so sleepy that he did not see the signals.

On the morning of the 22d a freight train on the Wabash road ran into the rear of a preceding freight in Peru, Ind., wrecking two cars and blocking the road three hours. There was a heavy fog at the time.

On the 22d a freight train on the Pittsburgh, Cincinnati & St. Louis road ran into the rear of a preceding freight, which had stopped at Urbana, O., damaging several cars and injuring a tramp who was stealing a ride.

On the morning of the 23d a freight train on the Chicago, Burlington & Quincy road ran over a misplaced switch and into the rear of another freight which was standing on a siding at Mendota, Ill. The caboose and two cars of the standing train were wrecked; the engine of the other was thrown over and damaged.

On the afternoon of the 25th a Canada Southern passenger train ran into the rear of a New York Central freight near the depot in Buffalo, N. Y. The engine and a car were damaged.

On the 27th a wild engine ran into the rear of a passenger train on the Connecticut Central road at Windermere, Conn., damaging the rear car.

On the night of the 28th a freight train on the Illinois Central road broke in two near Peotone, Ill., and the rear section afterward ran into the forward one, wrecking ten cars. The track was blocked eight hours.

On the morning of the 29th a freight train on the Philadelphia & Reading road ran into the rear of a coal train on a curve near Hamburg, Pa., wrecking five cars.

Early on the morning of the 30th part of a freight train on the Indianapolis Belt road, which had been left standing at the Jeffersonville crossing, started back down a grade, and ran into an engine which was taking in water at the stock-yards tank. The engine and several cars were damaged.

On the morning of the 31st a freight train on the New York, Lake Erie & Western road ran into the rear of another freight, which had stopped at West Paterson, N. J., damaging several cars and blocking the road two hours.

On the afternoon of the 31st a coal train on the Philadelphia & Reading road ran into the rear of a preceding coal train near Locust Gap, Pa., wrecking 35 coal cars, killing two trainmen and injuring another.

BUTTING COLLISIONS.

Very early on the morning of the 2d there was a butting collision between a Lehigh Valley and a Philadelphia & Reading freight train on the Lehigh Valley track near East Penn Junction, Pa. Both engines were damaged.

On the morning of the 7th a west-bound passenger train on the Pittsburgh, Cincinnati & St. Louis road ran into the head of an east-bound freight near Mingo Junction, O., both trains running at a good speed at the time. Both engines were completely demolished, two mail cars and the emigrant car thrown down a high bank and badly wrecked, and several freight cars damaged. The engines met with so great a shock that the crash was heard a mile away. The emigrant car was full of passengers, who went down with the wreck and were piled up with it at the foot of the bank. The passenger engineer, three postal clerks and 14 passengers were killed or hurt so that they died in a short time; the freight engineer, both firemen, two postal clerks and 35 passengers were injured. The sleeping cars remained on the track and were only slightly damaged. It is said that the freight conductor's watch was 20 minutes slow, and instead of waiting for the express at Alexandria Road, as he should have done, he started out, thinking he had plenty of time to get to Mingo Junction.

On the night of the 9th, near North Vernon, Ind., on the Ohio & Mississippi road, there was a butting collision between a freight train and a freight engine running light. Both engines were badly damaged, both engineers and both firemen hurt and a man who was riding on the wild engine was killed.

On the evening of the 19th, on the New York Central & Hudson River road, in Rochester, N. Y., an engine backing down toward the depot ran into the head of a freight, and the freight engine and ten cars were badly broken and piled up together.

On the afternoon of the 22d, on the Auburn Branch of the New York Central & Hudson River road, near Cayuga, N. Y., there was a butting collision between two freight trains by which both engines were damaged and one engineman killed. An order had been sent to stop the east-bound freight at Cayuga, but it is said that the operator forgot to deliver it.

On the morning of the 26th, on the New York Central & Hudson River road, in the yard at Albany, N. Y., there was a butting collision between a passenger train and a yard engine, which tried to back some cars across the track in front of the other train. Both engines and several cars were wrecked. The engineer of the passenger train jumped, was caught under a car and killed.

On the afternoon of the 28th there was a butting collision between two freight trains on the Pittsburgh, Cincinnati & St. Louis road, near Smithfield, O., by which both engines and several cars were badly broken, and the road blocked six hours. The accident is said to have been caused by a mistake in orders by an operator.

Early on the morning of the 29th there was a butting collision between two freight trains on the Cleveland, Columbus, Cincinnati & Indianapolis road, near Enon, O., by which both engines and 12 cars were badly wrecked. The engineers and firemen jumped and escaped, but a man riding on one of the trains was hurt so that he died in a short time. The collision was caused by a mistake of one of the conductors in interpreting orders.

CROSSING COLLISIONS.

On the 16th a Delaware, Lackawanna & Western freight train ran into a New York, Lake Erie & Western freight at the crossing of the two roads in Binghamton, N. Y., throwing over several cars.

On the 29th a passenger train on the Central Railroad of Iowa ran into a Chicago, Rock Island & Pacific passenger train at the crossing of the two roads in Grinnell, Ia. The Central engine and two Rock Island cars were badly broken, and five passengers slightly hurt.

DERAILMENTS, BROKEN AXLE.

On the 1st the engine of a passenger train on the Eastern Railroad was thrown from the track in Boston, Mass., by the breaking of a driving axle. The engine was badly damaged.

On the 13th 11 cars of a freight train on the Great Western Railway were thrown from the track near Simcoe, Ont., by the breaking of an axle. The cars went down a bank and were badly broken.

On the night of the 27th the engine of a coal train on the New York, Lake Erie & Western road was thrown from the track at Pond Eddy, Pa., by the breaking of a driving axle, blocking one track several hours.

DERAILMENT, BROKEN TRUCK.

On the night of the 21st several cars of a coal train on the Baltimore & Ohio road were thrown from the track near Black Creek, Md., by the breaking of a truck under one of them.

DERAILMENT, BROKEN COUPLING.

On the afternoon of the 21st the postal car of an express train on the Baltimore & Ohio road was thrown from the track near Piedmont, W. Va., by the breaking of a coupling. The car and the baggage car following it were badly broken.

DERAILMENTS, WASH-OUT.

Late on the night of the 6th a passenger train on the New London Northern road ran into a wash-out near Northfield Farms, Mass. The engine and tender broke loose from the cars and went down into the gap, which is said to have been nearly 40 feet deep. The engineer, fireman and a man who was riding on the engine went down and were killed or fatally hurt; the conductor and a brakeman were slightly injured. The train was running slowly and looking out for trouble, as there had been a violent storm.

On the afternoon of the 10th a passenger train on the New Jersey West Line road ran into a wash-out near Basking

Ridge, N. J., the engine leaving the track, while the baggage car rolled down a bank. Six passengers were slightly hurt.

DERAILMENTS, SPREADING OF RAILS.

On the evening of the 2d several cars of a passenger train on the New York & Manhattan Beach road were thrown from the track near Parkville, N. Y., blocking the road two hours. The accident is said to have been caused by the rails spreading, owing to washing by a heavy rain.

On the 6th the engine and one car of a passenger train on the Olympia Railroad were thrown from the track by the spreading of the rails near Tenino, Wash. Ter.

On the 23d two cars of a construction train on the St. Martins & Upham road were thrown from the track by the spreading of the rails near St. Martins, N. B. The spreading is said to have resulted from expansion caused by the great heat of the sun.

DERAILMENTS, ACCIDENTAL OBSTRUCTION.

On the night of the 5th a freight train on the Lehigh Valley road struck some of the timbers of some wrecked coal cars, which had been thrown over the track by a collision of coal trains on the other track, near Bound Brook, N. J. The engine and several cars were thrown from the track, the fireman killed and the engineer hurt.

Very early on the morning of the 6th a freight train on the Wabash road broke in two near Jacksonville, Ill., and a drawhead pulled out and fell on the track, throwing off several cars, which were piled up in a bad wreck, blocking the road seven hours.

DERAILMENTS, CATTLE.

On the 10th a freight train on the Baltimore & Ohio road ran over a four-horse team and wagon, which were crossing the track near Hood's Mills, Md., and the engine and several cars were wrecked. A tramp, who was stealing a ride, was killed, and four persons hurt.

On the night of the 14th a freight train on the Marietta & Cincinnati road ran over a horse on a heavy grade near Chillicothe, O., and the engine and 28 cars were thrown from the track, some of them being badly broken. The fireman and a brakeman were killed and the engineer badly hurt.

On the night of the 25th the engine of a freight train on the Baltimore & Ohio road ran over a cow in Wheeling, W. Va., and was thrown from the track, blocking the road some time.

DERAILMENTS, MISPLACED SWITCH.

On the evening of the 20th the engine of a freight train on the Philadelphia, Wilmington & Baltimore road was thrown from the track in Chester, Pa., by a misplaced switch.

Early on the morning of the 23d an extra train of empty passenger cars on the Long Island road was thrown from the track by a misplaced switch at Belmont, N. Y. The engine and two cars were badly broken, the engineer and fireman slightly hurt.

On the morning of the 27th the engine and two cars of a freight train on the St. Paul & Sioux City road were thrown from the track by a misplaced switch in St. Paul, Minn., the engine leaving the track entirely and half burying itself in the sand.

On the evening of the 27th four cars of a coal train on the New York, Lake Erie & Western road were thrown from the track near Lordville, N. Y., by a misplaced switch, blocking the road two hours.

DERAILMENTS WITH MALICIOUS INTENT.

Late on the night of the 3d a passenger train on the Pittsburgh, Ft. Wayne & Chicago road struck a rail which some person had laid across the track near Upper Sandusky, O. The pilot pushed the rail a short distance, when it caught in a switch, throwing the engine and two cars from the track. The road was blocked three hours. Some tramps were arrested on suspicion, but nothing could be proved against them.

Very early on the morning of the 14th a freight train on the New Jersey Midland road was thrown from the track in Paterson, N. J., by a switch which had been purposely misplaced. The engine and five cars left the track, but were not much damaged. The switch is believed to have been misplaced by tramps.

DERAILMENTS, UNEXPLAINED AND MISCELLANEOUS.

About noon on the 1st some cars of a coal train on the Delaware, Lackawanna & Western Road ran off the track at the west end of the Bergen Tunnel, N. J., blocking the road for a time.

Late on the night of the 5th a car in a freight train on the New York Central & Hudson River road ran off the track in Utica, N. Y., delaying its train four hours.

On the 9th a car of a freight train on the Lafayette, Muncie & Bloomington road ran off the track near Otterbein, Ind.

On the night of the 10th a passenger train on the New York & Manhattan Beach road ran off the track near Bay Ridge, N. Y., blocking the road two hours.

At noon on the 12th, as a passenger train on the Springfield, Jackson & Pomeroy road was stopping for dinner at Bainbridge, O., a drunken man jumped on the engine and opened the throttle. It started off at a great speed before any one could interfere, but after running a short distance jumped the track on a short curve, upset and was badly broken, killing the man.

On the night of the 12th a freight train on the Wabash road was thrown from the track near Antwerp, O., blocking the road several hours.

On the 13th a car in a freight train on the Connecticut Western road ran off the track at the bridge at Satan's Kingdom, Conn., and ran across the bridge on the ties before the train was stopped.

On the morning of the 15th a passenger train on the Delaware, Lackawanna & Western road ran off the track near Convent, N. J., delaying it some time.

On the 18th a freight train on the Wabash road ran off the track near Buck Creek, Ind.

On the evening of the 20th a switching engine on the Housatonic road ran off the track in the yard at Bridgeport, Conn.

On the afternoon of the 21st five cars of a freight train on the Wilmington & Northern road ran off the track at Dupont, Del.

On the morning of the 24th a car in a freight train on the Pennsylvania road ran off the track near East Liberty, Pa., causing a slight delay to trains.

On the morning of the 24th three cars of a coal train on the Pittsburgh, Cincinnati & St. Louis road ran off the track in Pittsburgh, Pa.

On the morning of the 26th five cars of a freight train on the Pennsylvania road ran off the track at Braddocks, Pa., doing a little damage.

On the 26th, as a repair train on the Illinois Central was being run into a gravel pit near Kankakee, Ill., the brakes failed to hold, owing to weeds crushed on the track, making it slippery, and several cars ran off the end of the siding and were piled up against a bank.

On the 27th a car in a freight train on the Intercolonial road jumped the track in Halifax, N. S., and was badly damaged.

On the night of the 27th a freight train on the New York, Lake Erie & Western road ran off the track in Paterson, N. J., blocking the road two hours.

Very early on the morning of the 28th the postal and baggage cars of an express train on the New York, Lake Erie & Western road jumped the track at Carr's Rock, Pa., and the baggage car was damaged. The train was delayed five hours.

On the morning of the 28th a repair train on the Northeastern road ran off the track at Four-Mile Turnout, S. C., blocking the road for a time.

About noon on the 28th two cars of an excursion train on the Grand Rapids & Indiana road ran off the track near Lockwood, Mich., went down a high bank and were wrecked injuring three persons fatally and 32 others less severely. It is said that the accident was caused by a Flint & Pere Marquette car with narrow-tread wheels, the Grand Rapids & Indiana being 4 ft. 9½ in. gauge.

Early on the morning of the 29th, as some freight cars on the Central Railroad of New Jersey were being run by a switching engine upon a float at Jersey City to be ferried over to New York, the chains holding the float to the slip gave way and four loaded cars were backed into the river and badly broken.

On the afternoon of the 29th a car in a freight train on the New Haven & Northampton road ran off the track in New Haven, Conn. The car ran into a building adjoining the track and was badly broken.

On the night of the 30th a freight train on the Indianapolis, Cincinnati & Lafayette road ran off the track near Whitestown, Ind., blocking the road several hours.

OTHER ACCIDENTS.

On the 6th, as a passenger train on the New York, Lake Erie & Western road was near Howell's, N. Y., one of the parallel rods broke, tearing one side of the cab to pieces.

On the 4th a parallel rod on the engine of a passenger train on the Cleveland, Columbus, Cincinnati & Indianapolis road, broke when the train was near Shelby, O., and the loose end completely broke up one side of the cab.

On the night of the 10th a car in a freight train on the Chicago, Burlington & Quincy road caught fire when the train was near Batavia, Ia., and was destroyed.

On the 14th the engine of a passenger train on the Delaware & Bound Brook road broke a connecting rod near Bound Brook, N. J., and the engine was somewhat damaged.

This is a total of 75 accidents, whereby 36 persons were killed and 108 injured. Thirteen accidents caused the death of one or more persons; six caused injuries less than death, while in no less than 56, or 74.7 per cent. of the whole, no serious injury is recorded.

As compared with August, 1877 there was a decrease of 23 accidents; of 10 in the number killed, and of 112 in that injured. In August of last year there were a large number of fatal accidents.

These accidents may be classified as to their nature and causes as follows:

COLLISIONS:		
Rear collisions	17	
Butting collisions	8	
Crossing collisions	2	
	—	27
DERAILMENTS:		
Unexplained	20	
Broken axle	3	
Broken truck	1	
Broken coupling	1	
Wash-out	2	
Spreading of rails	3	
Accidental obstruction	2	
Cattle on track	3	
Misplaced switch	5	
Malicious obstruction	1	
Runaway engine	1	
Running off end of siding	1	
Narrow-tread wheel on compromise gauge	1	
	—	44
Broken connecting rod	3	
Car burned while running	1	
	—	
Total		75

Three collisions are reported as caused by mistakes in giving or receiving orders; two by misplaced switches; one each by a train breaking, by fog, by a flying switch, by want of signals and by cars blown out of a siding, while one, the most fatal of all, is said to have happened because a conductor's watch was 20 minutes slow. In one case of misplaced switch derailment, the switch was purposely set wrong. There were 14 accidents traced directly to defect or failure of road or equipment.

Of the collisions two were between passenger trains, five between a passenger and a freight, and 20 between freight trains; 12 derailments were of passenger and 20 of freight trains, and of the other accidents three happened to passenger trains and one to a freight train. In this rough classification, service trains are included with freight. The 27 collisions killed 25 and injured 60 persons, while in the 44 derailments 11 were killed and 48 injured.

Two malicious derailments are reported, one by the placing of an obstruction and one by a misplaced switch. Six accidents—two collisions and four derailments—were caused by switches carelessly left wrong, showing quite the usual amount of negligence in this respect. Collisions are a little over one-third of the whole number of accidents, which is about the usual proportion. Some of the usual causes of accident at this season, such as cattle and wash-outs, are in smaller number than might be expected. For some reason our record shows that in August the number of accidents and also of killed and injured is greater than in either of the other summer months; this fact may be shown by the following statement for four years:

	1878.			1877.		
	Acc.	Killed.	Inj'd.	Acc.	Killed.	Inj'd.
June	56	12	58	49	16	92
July	54	7	41	53	21	144
August	75	36	108	98	46	220
	1876.			1875.		
	Acc.	Killed.	Inj'd.	Acc.	Killed.	Inj'd.
June	52	19	75	61	23	67
July	70	17	69	73	33	50
August	78	22	76	114	27	110

Some explanation for this may be found in the fact that August is usually the month when sudden and violent storms are most frequent, causing wash-outs, land-slides and failure of bridges, and interrupting the regular movement of trains. The August just past, however, has been unusually free from such visitations; only two wash-outs are reported and the most fatal accidents were from causes that might be expected at any season. Nevertheless the rule appears to hold good, and of the 185 accidents, 55 killed and 207 injured in the three summer months of 1878, the August record includes 40.5 per cent. of the accidents, 65.5 per cent. of the killed, and 52.2 per cent. of the injured.

For the year ending with August the record is as follows:

	No. of accidents.	Killed.	Injured.
September	84	20	88
October	82	31	112
November	83	23	70
December	66	8	20
January	75	23	77
February	67	8	31
March	49	5	14
April	46	12	55
May	50	13	44
June	56	12	58
July	54	7	41
August	75	36	108
Totals	787	198	724

The averages per day for the month were 2.42 accidents, 1.16 killed and 3.48 injured; for the year they were 2.16 accidents, 0.54 killed and 1.98 injured. The average casualties per accident were, for the month, 0.480 killed and 1.440 injured; for the year, 0.252 killed and 0.920 injured.

The Stores Department on English Railroads.

The *Stores Department*, the next in the order of survey, is the *commercial* arm of the service and the chief store-keeper, or stores superintendent, is perhaps the only officer in the service whose principal qualification is that of merchant. He needs no special *railway* experience, and yet he can be trained nowhere else. An American general store, where everything, "from a needle to an anchor," may be procured, seems to our mind the nearest approach to a training-ground, yet, transplanted from that likely soil to a railway store, the would-be store-keeper would find himself confronted by multitudinous difficulties, for overcoming which he had no ready resource. No great commercial undertaking, however extensive the range of its operations, and no branch of the public service makes such a variety of demands upon its leading spirit as this department of railway enterprise; and we hope to show, by an examination of some of the details, that it is perhaps the most interesting of the many departments into which railway management is divided. We are aware that the practice of the companies in the purchase and distribution of stores is dissimilar. In our treatment of the subject, therefore, it is likely that no two companies will recognize an exact picture of their special *modus operandi*. We think it better, for the information of the uninitiated, to describe a stores department in which every conceivable requisite for railway working may be found in stock, or through which every department is supplied with these.

When a line of railway is projected, as everyone knows, its construction is contracted for, the contractor finding all necessary material. Immediately it is opened for traffic the company owning it begins to be responsible for the supply of everything needful for working that traffic. It procures all classes of rolling stock, engines, carriages, vans (luggage, brake, meat and fish), wagons, etc., of their several classes and capacities. *Then* the labors of the stores superintendent commence. Engines will not move without coal, oil and grease. They cannot be coaled without shovels, oiled without tin vessels from which to drop the oil, or greased without the grease-pan and the stick. The driver must have tools for the accidents incident to constant running, nor can he keep his fire-box clean without rakers, or his oily machinery sweet and in a condition favorable to smooth working without "waste." When an engine goes into hospital for repair, the locomotive foreman at the "running shed" cannot set it up again without lengths of brass tubing, fire-bars, nuts, bolts, screws, sheet-iron, brass, valves, cocks, etc., and he cannot, if he possess all these in abundance, make any use of them without the needful tools. When carriages are put upon the traffic, they also must be greased and their wheels tapped at the principal stopping stations, and the tapping calls for a special hammer. In the daily traffic, carriages require exterior washing, and that implies the need of pails and brushes—not to speak of water—which, however, it is never the duty of the stores department to supply. Unfortunately for the companies—though fortunately for workmen and the manufacturers—carriage plant *will* deteriorate. The cloth covering and cushions wear, become greasy, or get cut into holes, and need repair. Without fine cloth or leather for the first, and coarser for the second or third class, these repairs cannot be performed. Buttons and binding are in constant requisition, new leather straps for the windows, new blinds, and now and again new glass. The parcel racks get out of repair and call for new netting or new rods, the clean, light leather-cloth covering the paneling or the gilt beading becomes the worse for wear, and must be replaced; so must the carpet with the company's motto and crest, and the perforated matting for the smoking compartments will not last for ever. Frequent tossing about from roof to platform, that is, from the roof to the hands of the lampman on the platform, and much rough usage in the lamp-room, tell, sooner or later, on the whole fabric of the roof-light, and the glass globes get broken, the tinned work battered out of shape, and the brass and iron mountings worn or destroyed. A much-enduring British public will not sleep in the dark on a night journey on that account, however, and repair or replacement follows damage or destruction. The exterior of the carriage has its demands on constant attention also. It is first to sustain injury in accident. If the whole fabric is not smashed in disastrous collision, panels are split or crushed in, door-handles are wrenched off, foot-boards are torn away, springs, wheels or axles, couplings, chains, draw-bars or buffers are broken, or, in the ordinary wear and tear of everyday use, these latter give way, as does the paint, this last with frequent washing. When a carriage goes into the repair shop for any or all of these repairs, there must be a supply of everything requisite, a handy, accessible stock of needful material. A different class of material is wanted for the repair of goods and mineral wagons, coarser and stronger, and more bulky as stock in store. Timber, bolts, spikes, screws, nuts, heavier springs and axles, stronger draw-bars, chains and couplings, coarser paints, etc., while wagons constructed to carry long timber and bar iron, cattle and sheep trucks, horse boxes and fish vans, each demand the keeping of a stock of articles peculiar to each when sent in for repair. The very tools required in the wagon repair shops, the running sheds, etc., are supplied, as required, from the store-keeper's stock. If the stores superintendent had nothing to do but provide all the material we have enumerated here, he might be admitted to have enough and variety of responsibility. His view is not bounded by the rolling stock, however. He has a look-out upon the permanent way. The elements and the constant passage of heavy traffic at high rates of speed combine to wear out rails, sleepers, spikes, bolts, nuts, keys, fish-plates, connecting rods, and the machinery of the signal box, its levers, joints, chains, rods, etc. These are in constant demand at all points of the system, the gangs of surfacemen or platelayers on their several lengths being continually occupied in replacing the old and worn-out with fresh material. The very tools

they use, their shovels, picks, hammers, crow-bars, are supplied from the same inexhaustible source. Then the telegraph staff must be supplied with wire of various strength, insulators, poles, and all needful tools for stretching or tightening and joining the wires, digging beds for the poles, etc. A special feature of the responsibility of the office of storekeeper, or stores superintendent, in connection with the provision of needful materials for the permanent way and telegraph departments, is that he is charged with the collection and care of all old superseded material. We shall refer to this further on, however.

The particular stores department we have in view as we write supplies stations with hand brushes for cleaning carriage seats and sweeping carpets, brushes for sweeping the platforms, pails and mops for washing the outside of carriages, chloride of lime for disinfecting water-closets, cattle trucks and pens, dusters and washing cloths for waiting room and office furniture and floors; oil or candles for the station signal lamps, clocks and telegraph instruments, and contracts for the supply of time bills and other such posters. It supplies, repairs and replaces station lamps, burners, reflectors, extincteurs, and all that is necessary to keep the station fire-engines in good repair and working order; and at terminal stations foot-warmers for the winter passenger traffic, tail-ropes, spare couplings, snibbles, screw-jacks, and all handy appliances for getting carriages and wagons that have left the metals into position again, are also draughted from the stores, together with rope and twine, and all such useful articles; add, of course, there is always a plentiful supply of grease, oil and waste for the cleaners on the station staff, and soap and towels for the cleansing of the clerkly hands. Indeed, even in the matter of supply of office furniture, and its repair from time to time, the stores department is charged with the responsibility. Wagon and lorry or van covers are also made and repaired by that active and many-sided department; while, of course, books of all kinds, invoices, parcel way-bills, audit office and clearing-house returns, inaccuracy sheets, over and undercharge forms, memorandum forms, letter and note paper, envelopes, pens, ink, pencils, pins, rulers, ink glasses, india-rubber, blotting paper, brown paper, foolscap, tickets, luggage, game and fish labels, wagon labels, "engaged" and "smoking" labels, etc., etc., are provided from the same boundless stores. There is really no limit to the demands made upon the department: scarcely any branch of industry with which it has not intimate connection.

We have referred to a special stores department, which we have selected as possibly representative of the practice of the most extensive. In that special instance there is a large saw-mill, in which logs of all kinds are cut to all sizes, for every conceivable purpose, the scraps being cut into brake-blocks, or, when not available even for such modest purposes, into firewood for office use. There is also a tinsmith's shop, where the company employ a large number of workmen and apprentices in the manufacture and repair of foot-warmers, signal, station, platform, carriage, van and engine, and hand-lamps of all descriptions; reflectors, oil cans, and other tin work of a miscellaneous character. Ten minutes in that shop are enough to deafen the unaccustomed for life, and yet the workmen hear each other speak! But for the noise, a look around will interest even the stolid. We walked into the shed where the grease for lubricating the axles is made. The process is interesting, but should not be witnessed before dinner. The odor emitted from boiling palm oil and tallow is not appetizing. Still less it is conductive to the enjoyment of dinner to look through the sheet-shop and watch the process of coating the wagon sheets*. Yet half an hour there will repay the inconvenient experience of nausea. We found huge bales of canvas being cut into lengths and sewed together firmly and rapidly at several leviathan sewing machines—propelled by machinery—and should judge it was hot work. Boys were busy sewing in the brass and iron rings at the edges through which the fastening cord is passed when the sheets are in use. In another part of the building an extensive floorage was occcupied by men charged with mending used sheets. These parts of the building resembled a large sail loft. We were more interested in a new process for coating the sheets. It would serve no object to describe the machinery—for the process is one controlled and carried on by steam power—even if we were capable of or entitled to do so; suffice it to say that the machinery is simple. One engine supplies power to the coating apparatus, the preparation of the coating oil and the sewing machines. When a sheet is made it is sent to be coated. We follow it and find that the coating process consists of its being carried to a long table, alongside of which there is a long tank containing the coating material. One edge of the sheet is passed under a rod lying on the surface of the tank. That edge is then fastened to a movable rod suspended horizontally over the table. The machinery is set agoing, and the sheet is drawn tightly and strongly through the tank and folded lengthways, as it rises, on the table. It went into the tank of a fair giraffe color—it is folded lamp or coal black. The process does not occupy over two minutes, and it secures—much more than the old system of hand-painting—a thorough saturation of the canvas. It sometimes happens that in the rapidity of flight of the canvas through that river of Lethe, lurks and folds occur, and a second coating has to be performed. Even then, however, the whole process is over in five minutes or less. The sheet thus blackened is then hung up to a lofty ceiling, the building being warm, and in a day or two is dry and ready for a second plunge in the "black broth"—to be folded and then hung up till dry enough to admit of stencilling the company's name and marks and the consecutive number of the sheet upon it. In this sheet-shop there are upward of 4,000 wagon, lorry and cart covers made annually, requiring about 150,000 yards of canvas. The work is not *sweet*, as we have said, and it is not clean; the workmen's hands and arms are plunged continually in a bath consisting of oil, lamp-black and other such ingredients, which, if cooling in hot weather, as probably it is, requires hot water and soap, with a little persistent friction, to remove its traces. Another interesting but not too pleasantly odorous operation, conducted under the care and supervision of the stores superintendent, to whom we have already referred, is that of creosoting timber. Sleepers would not live out half their days, nor would telegraph poles stand up for themselves so independently if they were not carefully water-proofed before being used. Creosoting has been proved the best choke-damp, and, as it is the property of the purchaser of the patent, the right to use the process must be bought. The company in question and some others have undertaken the experiment of creosoting their own sleepers and telegraph poles, and each with some measure of success, although the time has scarcely arrived when a decided opinion may be offered as to the financial value of the experiment of creosoting their own timber. We looked in at the works and were at once seized by the nose, not by the manager or his assistants, but by the creosote fumes, which are very pungent. Around us on every hand were piles of fresh sleepers, and yet fresher were being unloaded from scores of wagons. The process of creosoting was new to us, and possibly may be so also to most of our readers, so we shall not apologize for describing it shortly. In the first place, creosote oil is laid in in tanks under the ground level. Large air-tight cylinders, made of stout boiler plates, and of the form of an elongated egg, opening at both ends, are placed conveniently to the tanks; there is an engine at hand communicating with the cylinders and the tanks; the cylinders are filled tightly with sleepers or poles, the ends are closed and screwed firmly, the engine pumps out all air from the cylinders, sucks out all moisture from the pores of the wood, and then, having produced a vacuum, the opening of a valve in a communication from the tanks affords a passage for the oil, which is sucked in till, filling up all available space, it ceases flowing, and the operation is almost at an end. The oil in this way not only covers the surface of the timber, but is literally forced by a natural law into the vacant pores, and half an hour concludes the process. The workmen then unscrew the bolts in the ends of the cylinders, throw the doors open and then proceed to discharge them. Then it is seen that the timber, the last staves of which but half an hour ago you saw built in green and clean, has been not only coated but literally *packed with oil*, and, in all likelihood, thoroughly "impervious to damp." We were told that if the timber is fairly dry it takes but *three hours* from the charge to the discharge of the cylinder, as many as from 450 to 500 sleepers being creosoted in that time in each cylinder. If the sleepers have been exposed to damp before the process, it takes longer to expel the moisture and prepare for the ingress of the oil. This will be manifest to our readers. We stood for some minutes at one end of a cylinder while it was being discharged, and were warned not to risk a longer exposure to the fumes, as they have the effect, when escaping from their confinement, of attacking the skin of the unaccustomed and making it *smart* violently. We were also warned against treading on the creosoted timber, or on the ground in its immediate vicinity, lest we should carry away the odor to diffuse it unwelcomely in the railway carriage, the office, or the parlor at home. The workmen change their clothes every time they leave work.

We have thus shortly endeavored to show the range of the stores superintendent's duties and responsibilities, by describing the indebtedness of *all* departments to his arrangement and forethought. No railway work can be performed without his aid. All departments are dependent upon his watchfulness and readiness. Walk through the labyrinths of his repository, and say what you *cannot* find there. We could fill a column and a half with a bare list of the articles lying on his shelves. All kinds of permanent way materials and tools, locomotive materials and tools, wagon and carriage materials and tools, telegraph materials and tools, candles for signals, soap and soap powder, sponges, clocks and watches, india-rubber goods, crucibles, fittings for signals, spelter, tin and lead, spring balances, steam gauges, office and waiting-room furniture, carriage fittings and trimmings, cloth for uniforms, drysalteries, gas and water fittings, glass goods, grain sacks, lamp furnishings, locks for carriages, desks, drawers, etc.; lamp-wick cottons, pressure gauges, grindstones, oils for lubricating and burning, for paints, and for creosoting purposes; ropes, cordage and twine, dressed flax, baskets, felt, varnishes, timber, coals, coke, ironmongery, matches, needles, dressing-combs, blankets, water columns, injectors, safes, stationery of all conceivable kinds and qualities, etc., etc., etc. These are but a few of the wares you will find displayed in a most orderly chaos on the rows of shelves, or stacked in the spacious timber yards and iron stores. Look in upon the heads of departments and see how carefully the stock books are kept; not a pound of goods or a yard of material comes in or goes out without a careful debit and credit entry, so that a reference to any of these books at any moment reveals at a glance the quantity on hand of any article, and warns the stores superintendent when and what to buy. We have referred to the item of cloth for uniforms as among those kept in stock. We have seen bales of blue cloth—superfine, for station-masters, guards and inspectors; pilot, for goods and mineral brakesmen, and corduroy for porters—together with uniform caps of all kinds. We were carried from the raw material to the tailor's shop, where something like 50 men were discovered busy at work, making up uniforms of all classes, shapes and sizes, and were told that that was the permanent staff of tailors. Uniforms are only delivered once a year, but everything else is in constant demand. Contracts are made annually with merchants and manufacturers for the supply of goods special to them, the stores superintendent having previously satisfied himself as to the utmost of his possible requirements in all branches. Should the quantity contracted for be less than that needed, he knows he must buy further at the market price then ruling; if more, he must keep it in stock till wanted. There are several items for which he cannot find room, demanding a larger stock than will suffice for a few months' need, such as coal, coke, timber and rails. These, moreover, fluctuate so much in price that it is rarely expedient to make long contracts. For these, the stores superintendent must, therefore, be frequently in the market, and he needs be a shrewd observer of daily prices to know when to buy. In all his dealings with the merchants and manufacturers his capacity is severely tested. None of them claim a tithe of his knowledge of *everything*, but each is a *specialist*. To be a successful purchaser, to be able to meet them all, he must know not only *something* of everything he buys, but so much of everything as will enable him to buy wisely. He must be a judge of both quality and price. What buyer in the largest mercantile establishment in the world is required to profess a knowledge so diffuse? The stores superintendent we have taken as our sample is not only this capable merchant, this wise and careful caterer for every want of the railway system; he is also a practical analytical chemist, keeping a sample of every article contracted for, and a correct record of its whereabouts when wanted. He is able to bring almost every product purchased to an infallible chemical test, detecting by that means the *shade* of inferiority of a spurious article, and demonstrating that to a certainty. His laboratory is his touchstone for fabrics and metals alike, and by means of it he has sharpened his mercantile wits. The knowledge that he *can* test the materials he purchases, and is, therefore, not easily duped, has helped to narrow the circle of his contractors to those who wish to do honest business.

The stores superintendent not only *buys* for the railway company, of which he is a most invaluable officer, and distributes to the various departments what they require to their several orders—he also *sells*. All old materials—permanent way, locomotive and telegraphic—are collected by, or sent in to him, and he, watching the market, must judge of the best time to dispose of these. Such is a short and somewhat meagre account of the duties and responsibilities of the stores superintendent. He is a veritable Admirable Crichton. It is not every man who combines in himself so many high qualities—the quality of the merchant, the chemist, the almost omniscient administrator. The man who serves the office efficiently is possessed of qualities of mind of a high order, and is worthy of high consideration. His chief assistant has a splendid field for observation and practice, and the heads of departments should store up their experiences. If these may not all be stores superintendents, they may become invaluable, because methodical book and store-keepers. —*The Railway Sheet* (*London*).

* The covers of water-proof cloth which are fastened over the goods in the open English freight car, to protect them from the weather.—EDITOR.

People You Meet on the Train.

Coming down on the Minnesota & St. Louis Railway today, I glanced my Hawkeyes along the coach, and lo, I saw

THE WOMAN WHO IS AFRAID OF THE DUST.

She pulled down the window and made ready to suffocate. Then she knotted a handkerchief closely around her neck—no, she pinned it; a woman never ties anything that she can pin; then she tied a double veil over her hat and face. She sat in the middle of the seat, and drew her duster tightly around her. She looked at her feet from time to time, and sighed gloomily when she saw the dust was clustering around them. She rode from Minneapolis to Waseca and never moved; never looked out of the window, and only spoke once. A sociable passenger, thinking she looked kind of desolate, said:

"How kind o' coolin' an' refreshin' like it is to see these clear lakes all around us, when the day is so clear."

And she said, "The dust is perfectly awful."

And when the sociable passenger said that "dust wan't nothin'; ye know the Lord made Adam out of dust," she said.

"Oh my, how could he touch it! And think what his hands must have looked like."

And she shuddered.

I have always noticed that the dustier and grimier I get on a train, the more vicious and hateful I feel toward the people who keep themselves neat and clean Just behind this woman I saw

THE WOMAN WHO IS ALWAYS FALLING TO PIECES.

She came to the station a little late and had to make a rush for the train. When she reached her seat her hat fell off. She got it on, but it toppled over to one side, and when she tried to straighten it up her hair came tumbling down. She lost her ticket twice before the conductor reached her, and would have lost it again if he hadn't taken it away from her She reached up to put a bundle in the rack above her head, and burst the collar button off her duster, and stuck her fingers on four pins in her dress before she could find one that she dared take out to repair the damage. Then just as she thought she had got comfortably settled her little hand valise, packed to bursting with enough things to load a Saratoga trunk to the muzzle, exploded, and she nearly worked herself into fragments getting it together again. Then by the time she got the valise shut up her hat tumbled off again, and by the time she got the hat straightened back into its place, her hair tumbled down again, and as soon as she got her hair twisted up, and harpooned it with a couple of hair-pins, the valise went off, and when she got off at New Prague, she tucked the gasping valise under her arm, and tried to corral her toppling hat and wandering hair with one hand, and as she went fluttering and struggling into the depot, one couldn't help thinking that it would be safer and more convenient to run her in sections and flag her against everything. I have seen this woman on several other trains, and she has never been able to keep herself together. There seems to be more average humanity about her than there is about her neater sister. She isn't so aggravating, but she keeps you in a state of agonizing suspense, for you never know where she is going to give way next.

Moreover I saw

THE BOY WHO WANTED A DRINK,

a restless, questioning, uneasy, thirsty boy. He let the window fall on his fingers before the train had gone a mile. He stood out on the platform until he was encrusted two inches deep with ashes and dust and cinders. He went to the water cooler and got a drink, then he came back and told his mother he was hot and went back and got another drink. He drank about four times per mile, seldom oftener, unless he was seized with a sudden uncontrollable spasm of thirst. If he was drinking and somebody else came after a drink, the boy would suddenly seize the cup he had just set down and refill it and drink as though he had wrapped his stomach in the Desert of Sahara, glaring suspiciously over the top of the cup at the waiting passenger as he drank. When he was in his seat he watched the aisle narrowly, and if he saw any passenger get up and move toward the water cooler, he would jump up and race for it. If he got there first, he would drink and snore over the cup until the thirsty traveler forgot what he went down there after. People began to wonder how much the boy was gauged for, and if he wasn't rather straining his capacity. The remotest hint or suggestion was enough to send him to the cooler. When the train ran over a creek, the water made him think of his thirst. When it rattled over a long stretch of dry prairie, the absence of water drove him mad. I was afraid the supply of water would give out before the boy was filled up, and he was a rather small boy, too. His interior circumference, I think, must have inclosed an area double in extent to that inclosed by the exterior belt. Near Waseca, we run nearly a mile without the boy making a stop at the tank. I grew very nervous now, for I was fearful that during such an unheard of abstinence from water his pumps would run dry, rust out, and he might blow up. So I leaned over the edge of the seat and said, carelessly:

"By George, but I *am* thirsty. I wonder if there is any water in this car?"

You want to understand me now as recording very plainly, and without any mental reservation, the fact that that boy's mother, sitting beside him, was no fool. Her eyes snapped when she heard my careless and innocent remark, she took in every syllable of it, and she turned on me in a flash with:

"I wish you would mind your own business and leave my boy alone!"

A low, mocking murmur of applause went through the car, a little of it for the indignant mother, some of it for the charity boy, but most of it for me. She suppressed yours truly very successfully, but it was too late. Long before she finished that brief sentence, her boy was down at the water cooler, holding his eyes tight shut to keep the water from running out of them, while he flooded his system as though he had taken a contract to keep up a perennial Baptist revival inside of himself.—*Burlington Hawkeye.*

Chaplain to a Railroad Company.

Rev. Mr. McGowan, of Salinas, who also holds services in Monterey, twenty miles distant, has heretofore been obliged to go back and forth in a wagon, or else pay the railroad fare. "A few days since," says a Salinas paper, "a committee of ladies of his church here applied to Hon. S. C. Abbott, President of the Monterey & Salinas Valley Railroad, for a pass to enable their pastor to ride on the cars free of charge when making his Sunday visits to Monterey. But there was an obstacle in the way. The law forbids granting a pass to anybody except an employé of the road. After considering the matter a minute or so, the accommodating and generous-hearted President told the committee who had waited upon him, that he thought he could arrange the matter. Mr. Abbott then instructed his secretary to make out an appointment for Rev. Mr. McGowan as chaplain of the railroad, signed it and handed it to the ladies, together with a pass for the pastor, who, being an employé of the road, is, of course, entitled to ride free of charge." We wonder if there is another railroad in the country blessed with a chaplain?—*San Francisco Pacific Churchman.*

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CONTENTS.

EDITORIAL ANNOUNCEMENTS.

Passes.—*All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.*

Addresses.—*Business letters should be addressed and drafts made payable to* THE RAILROAD GAZETTE. *Communications for the attention of the Editors should be addressed* EDITOR RAILROAD GAZETTE.

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

MOVEMENT OF THE COTTON CROP OF 1877.

The *Commercial and Financial Chronicle*, which collects most careful and trustworthy statistics of the cotton trade, in its last issue published its annual review, showing the production, movement and consumption of the crop of 1877, the receipts, shipments, etc., being for the year ending with August, the cotton crop year. This gives us the material for a discussion of some of the phases of the movement which are most interesting to carriers. There are several thousand miles of railroad in this country to which the cotton crop is more important than any other crop is to any roads in the country. There is no part of the North, probably, at least none of considerable extent, which depends to so great an extent on a single crop of any kind as do the cotton states on cotton. Spring wheat is the only very important agricultural export of Minnesota and a large part of Wisconsin; but these states by no means live on wheat alone. The nearest approach to this dependence on a single crop is, perhaps, in the San Joaquin valley, in California, where scarcely anything but wheat is grown; but this exclusively wheat district is of comparatively small extent, while the cotton district extends from Wilmington to San Antonio. So far as the railroads are concerned, the connection between cotton and the railroads in the cotton states is in degree something like that between the anthracite coal roads and the production of coal, though, of course, not complicated by the ownership of the staple transported.

It is not true, however, that all Southern railroads are so dependent on cotton, for it is not the sole nor even the chief crop of the whole South. The cotton country proper, that where little else is raised for market, extends along the coast and generally for 100 to 200 miles inland. The valleys of the Allegheny range and the foot-hills on both sides, extending as far south as Charlotte, N. C., Columbia, S. C., Augusta, Macon and Columbus, Ga., and about to Montgomery, Ala., grow some grain and stock for the consumption of the country nearer the coast, and in many places comparatively little cotton. Neither of the Virginias produces much cotton, nor does Kentucky, and Tennessee's other products probably much exceed its cotton in value. But most of the railroads of the South depend largely on the cotton crop and the income which it brings, for their through traffic, even when it affords them directly but little local traffic, so that nearly all of them watch anxiously for the result of each season's planting.

As the leading export of the country—the export value the last crop year was probably about $185,000,000—it has also a general interest to merchants and the nation at large which accounts for the special attention which is given to this crop.

It is probably safe to assume that there is some change in the territory devoted to cotton growing, and that east of the Mississippi there is not and has not been for some years much increase in the area devoted to this crop. And the extension of cotton cultivation has probably been chiefly in Texas, which is the only Southern state that has grown rapidly since the war. But we have not the statistics of the production of the several states at hand, the *Chronicle's* figures being chiefly to show the aggregate production of the country, and the receipts and shipments of the different cotton markets. And receipts are no clue at all of state production. New Orleans, for instance, receives largely from Texas, Arkansas, Tennessee and Mississippi, as well as from Louisiana. But in studying the transportation of cotton the distribution of the receipts is quite as interesting as the production. These receipts are reported at the port at which they first arrive only. Much cotton which is first marketed at a Gulf or South Atlantic port is afterward forwarded to a Northern port, or even to some other Southern port, by sea or by rail; but these reshipments are excluded, so that no cotton is counted twice. Below we give the number of pounds received at the ports of each state for the last two crop years, with the percentage of the total received in each state's ports:

Cotton Receipts at Ports of Different States for the Past Two Years:

	1877-78.	P. c. of total.	1876-77.	P. c. of total.
Texas	231,770,490	10.0	254,163,078	12.1
Louisiana	655,405,449	28.3	542,247,131	25 8
Alabama	214,509,872	9.3	178,838,478	8.5
Georgia	288,430,452	12.5	228,195,200	10.9
South Carolina	209,137,465	9.1	212,019,552	10.1
Virginia	241,690,466	10.5	267,570,689	12.7
North Carolina	69,436,185	3.0	62,412,562	3.0
Tennessee, etc	399,528,528	17.3	355,018,416	16.9
Total crop	2,309,908,907	100.0	2,100,465,086	100.0

The aggregate increase in the crop was almost exactly 10 per cent. The changes in the percentages at the different ports are moderate—increases in Louisiana, Alabama, Georgia and in the group entitled "Tennessee, etc." (chiefly receipts of Northern ports directly by rail from inland points), and decreases in Texas, South Carolina and Virginia. The Texas receipts were exclusively at Galveston, the Louisiana receipts at New Orleans, the Alabama receipts at Mobile, the Georgia receipts 2.8 per cent. at Brunswick and the rest at Savannah, the South Carolina receipts 0.4 per cent. at Beaufort, etc., and the rest at Charleston, the North Carolina receipts exclusively at Wilmington, the Virginia receipts exclusively at Norfolk. The receipts given under "Tennessee, etc.," include 21,818 bales received at Fernandina, Fla., and 331,268 bales received first at Memphis, Nashville and other interior points in Tennessee, Mississippi, Texas, etc., and shipped direct to manufacturers or to some port north of Norfolk.

The crop of 1877 was probably the largest on record, and has astonished all the prophets. We say probably, for cotton statistics are usually recorded in bales, and a bale is a bundle, weighing more or less, varying in average weight in the different states, this year, by the *Chronicle's* statistics, from 461⅜ to 511⅞ lbs. In bales, the crop of 1877 exceeds all others except that of 1859, when there were 4,823,770 bales to 4,811,265 bales last year. The last year's bales were of considerably greater weight than those of any of the four preceding years for which weights were given, whence it is probable that they were larger than those of 1859 also, and that therefore the crop of 1877 was the largest ever known. Now for three years the cotton crop has varied only from 4,485,000 to 4,811,000 bales, none of which figures were ever equaled except in 1859, and this year's crop, if the season for picking is fairly favorable, promises to be larger than any of the rest. It is safe to conclude, therefore, that the cotton states have more than recovered from the shock of the war, which destroyed its resources and demoralized its labor. For the six years ending with 1860—those next preceding the war—the average yearly production was 3,764,350 bales; for the six years ending with 1877 it has been 4,316,644 bales—an increase of 14⅔ per cent. Only once before the war did the production reach 4,000,000 bales; since the war it has exceeded that amount five times; and for ten years (counting this year, the crop of which may exceed 5,000,000 bales and cannot fall below 4,000,000) it has averaged as much as that. Considering the havoc of the war and the general disorganization as well as destruction caused by it, this is remarkable progress.

Cotton is a freight which is carried long distances. All but a very small portion of the crop of this country is manufactured either in Europe or north of the Potomac, and most of the American factories are in New England. As the cotton country is all near the sea, and most of the factories quite close to the coast, the staple does not require a great deal of inland transportation. Texas cotton can go to Galveston, that produced near the Mississippi and its tributaries to New Orleans, etc., with but a few hundred miles of railroad transportation at most. This formerly was the course of most of the cotton, except that long and quite circuitous river routes (very cheap) were sometimes used. But of late years the cotton does not so generally go to the nearest seaport, and when it does it is not always for export or shipment by sea direct to Northern factories. For instance, more than two-fifths of Mobile's receipts last year were reshipped to New Orleans, as were more than a quarter of Galveston's receipts, and some shipments to the North were made by rail and river from New Orleans, and probably the other Gulf ports, as were very large amounts from the South Atlantic ports and from Memphis and other interior markets. Memphis shows the varied routes of cotton distribution probably better than any other place. Last year it shipped a total of 416,396 bales, of which 104,866 went to New Orleans, 85,936 to Charleston and other South Atlantic ports, while the rest went, partly by rail and partly by river and rail, directly to manufacturers and to Northern ports. Transportation is comparatively unimportant in the cotton business, and it seems not to be avoided, the cotton sometimes going to the consumer back over the same route by which it arrived at the primary market. And long rail routes are less avoided by cotton than by grain, of which the growing St. Louis business is evidence. A large part of these receipts come from Texas, from plantations six, seven and eight hundred miles distant; and when it gets to St. Louis it is still a thousand to twelve hundred miles from the factories where it is chiefly consumed, or the ports from which it is exported.

These receipts at interior markets give some clue to the distribution of the business among the carriers, which will give interest to the following table of receipts at those markets, in bales, for six years, compiled from the *Chronicle's* report for this and previous years. We add that in every case the shipments of these markets have been nearly the same as their receipts:

Cotton Receipts at Interior Markets for Six Years.

	1872.	1873.	1874.	1875.	1876.	1877.
Augusta, Ga.	180,090	200,017	178,380	172,592	189,694	164,010
Columbus, Ga.	58,872	61,229	58,107	51,873	72,534	73,350
Macon, Ga.	64,425	72,274	67,747	54,037	79,112	80,474
Montgomery, Ala.	62,645	33,919	59,319	72,727	67,337	106,284
Selma, Ala.	46,991	60,006	75,261	88,506	69,330	92,681
Memphis, Tenn.	414,955	429,327	322,004	487,376	384,358	412,393
Nashville, Tenn.	66,464	101,547	57,082	50,258	47,500	56,044
Total old ports	894,442	958,319	817,900	977,429	909,864	965,236
Dallas, Tex.	.....	.....	19,500	49,067	44,104	30,363
Jefferson, Tex	.....	.....	30,272	40,333	36,926	30,000
Shreveport, La.	76,580	77,903	82,044	104,095	101,835	103,779
Vicksburg, Miss.	.....	.....	61,228	129,180	55,048	171,347
Columbus,	.....	.....	20,032	21,282	22,042	27,420
Eufaula, Ala.	.....	.....	25,329	37,078	47,195	42,981
Griffin, Ga.	.....	.....	14,869	12,792	16,437	13,128
Atlanta, Ga.	30,635	58,750	63,150	60,150	90,175	100,418
Rome, Ga.	.....	.....	27,138	32,651	33,100	48,166
Charlotte, N. C.	.....	.....	38,096	42,628	48,236	53,280
St. Louis, Mo.	59,709	103,767	134,031	245,031	219,010	246,674
Cincinnati, O.	137,575	195,895	151,980	185,376	175,527	184,895
Total, new ports	304,499	431,315	667,662	960,263	889,635	1,055,451
Total all	1,198,941	1,389,634	1,485,562	1,937,692	1,799,499	2,020,687

Bearing in mind that in the time covered by these six years there has been an increase in cotton production, it would appear that there has been on the whole a decrease in the business of Augusta, Nashville, and perhaps Memphis, among what are called the "old ports," and an increase at Columbus, Montgomery and Selma, Macon remaining nearly stationary, and the seven "old ports" about holding their own in quantity received, though not getting quite so large a proportion of the whole crop as formerly.

At the new ports there has been a general, and in most cases a considerable, increase, with the exception of Jefferson, Columbus, Miss.; Griffin, Ga., and Cincinnati. Figures are given for all the "new ports" only for four years, and in those their aggregate re-

ceipts have been the following percentages of the whole crop, compared with those of the "old ports:"

	1874.	1875.	1876.	1877
Old ports	21.3	20.9	20.2	20.1
New ports	17.4	20.6	19.9	21.9
Total	38.7	41.5	40.1	42.0

The receipts of the "old ports" thus seem to be nearly a staticnary proportion of the whole—declining a very little; those of the "new ports" have increased pretty uniformly, but not rapidly.

The largest growth of receipts has been at St. Louis, which for three years has ranked second in the list of interior cotton receivers, though in 1873 it was only the eighth in the list. For the past three years, however, there has been no considerable increase at St. Louis. For the six years above reported the percentage of the whole crop handled there has been respectively: 1.5, 2.5, 3.5, 5.3, 4.9 and 5.1.

The receipts at St. Louis last year were about equivalent to 6,000 car-loads—which would make but an insignificant business in grain or live stock, but is reckoned important in cotton not so much because of the amount of transportation which it requires as because of the value which it represents. The six thousand car-loads of cotton were worth probably about $12,000,000; if loaded with grain they would have been worth but about $2,000,000 if of wheat, and (in St. Louis) not more than $1,000,000 if of corn.

More than two-thirds (69½ per cent.) of the cotton crop of 1877 was exported. For six years the total product in bales, total exported, and proportion of latter to former have been:

Year ending Aug. 31—	Total product.	Exports.	P. c. of exports.
1873	3,930,508	2,679,986	68.2
1874	4,170,388	2,840,981	68.1
1875	3,832,991	2,684,410	70.0
1876	4,669,288	3,252,994	69.7
1877	4,485,423	3,049,497	68.0
1878	4,811,265	3,346,640	69.6

The proportion exported, therefore, has remained about the same, which is equivalent to saying that the quantity manufactured in this country has increased just about in proportion to the increase in production.

There is no other great export staple of this country of which the outlets are so numerous. Cotton is exported from nearly every Southern city that has a tolerable harbor, many which have scarcely any other shipping business, either export or import. Comparatively little cotton goes north to be exported. But 18.6 per cent. of the total exports of the crop of 1877 was from ports north of Norfolk, and this proportion does not grow larger, but, on the contrary, was smaller last year than in any of the six preceding.

The percentage of the total exports shipped from each port for the past seven years is shown in the following table, from which the rank and changes in rank of each port may be ascertained:

Percentages of United States Cotton Exports from Different Ports for Seven Years.

	Year ending Aug. 31.						
	1872.	1873.	1874.	1875.	1876.	1877.	1878.
New Orleans	45.4	44.0	40.4	37.1	41.9	39.5	43.4
New York	19.0	21.4	17.1	16.6	15.2	14.2	12.0
Savannah	15.1	14.0	15.1	15.7	11.3	9.8	10.6
Charleston	5.7	6.0	8.7	10.2	8.7	11.1	9.1
Galveston	5.9	7.8	9.7	8.3	7.3	8.5	6.7
Mobile	7.0	5.0	4.7	4.9	7.5	7.2	4.9
Norfolk	0.2	0.3	0.7	2.5	3.3	4.0	4.8
Boston	0.7	0.4	0.9	1.4	1.8	2.5	3.8
Baltimore	0.7	0.7	1.5	1.7	0.9	1.0	1.7
Wilmington	0.3	0.4	0.2	0.6	0.9	1.2	1.7
Philadelphia			1.0	1.0	1.2	1.0	0.8
Portland			....	....	....	....	0.3
Fernandina			....	....	....	....	0.2

If we summarize these by classing Gulf ports, South Atlantic (Fernandina to Norfolk, inclusive) and Northern ports together, we have the following proportions:

	1872.	1873.	1874.	1875.	1876.	1877.	1878.
Gulf ports	58.3	56.8	54.8	50.3	56.7	55.2	55.0
South Atlantic	21.0	20.3	24.7	29.0	24.2	26.1	26.4
Northern ports	20.7	22.9	20.5	20.7	19.1	18.7	18.6

On this latter table the most striking feature appears to be the decrease in the proportions of exports from the Northern ports, which has been nearly constant. The other figures show fluctuations, but no decided tendency, unless it be to an increase at South Atlantic ports, which however seems to have ended four years ago. But if we look above at the reports for the several cities, we will notice that New Orleans apparently just about holds its rank, fluctuating, but not increasing or decreasing; its average for the seven years has been 41.6 per cent. New York's proportion has decreased constantly since 1873, and last year was but five-ninths of what it was then. Savannah has had a notably smaller share of the exports for the last three years than in the four years preceding, and its near neighbor, Charleston, has not gained what Savannah has lost, the exports for the two together having been the following percentages of the total exports in the several years:

1872.	1873.	1874.	1875.	1876.	1877.	1878.
20.8	20.0	23.8	25.9	20.0	20.9	19.7

This is probably explained by the growing business of the ports next north, Wilmington and Norfolk, which had scarcely any export business before 1875, but since that time have increased much faster than Savannah and Charleston have lost, so that, as we have seen, the South Atlantic ports together have received more of late years than formerly. Wilmington and Norfolk, apparently, have secured their export trade partly at the expense of New York, and partly at that of Savannah and Charleston, as suggested by the following comparisons:

	1872.	1873.	1874.	1875.	1876.	1877.	1878.
Savannah and Charleston	20.8	20.0	23.8	25.9	20.0	20.9	19.7
Wilmington and Norfolk	0.2	0.3	0.9	3.1	4.2	5.2	6.5
New York	19.0	21.4	17.1	16.6	15.2	14.2	12.0
Five ports	40.0	41.7	41.8	45.6	39.4	40.3	38.2

Considering the great increase in the production of Texas, Galveston has not made the progress that was to have been expected of it. Texas exports (which are nearly equivalent to Galveston exports) were a less proportion of the whole last year than in any of the five preceding years. But a very large share of Galveston's receipts go to New Orleans to be exported or otherwise disposed of, and moreover it by no means controls the Texas crop. The railroads work to carry it northward, and not a little goes down the Red River and to Memphis or New Orleans, and never sees Galveston at all.

The new crop has begun to come forward freely as the statistics of the old one are made up. It is an unusually early one, occupies more ground than last year's, and is, on the average, reported to be in as good condition, with the advantage, so far, of a better picking season. With as good weather this fall as last (and last year it was not very good) the prospect is of a larger crop.

"ADHESION," OR FRICTION UNDER GREAT PRESSURE.

Any one who has ever had occasion to calculate the power of a locomotive, or the load which it will haul, has found that the data on which such calculations are based are very vague, and that the calculations give only approximately correct results. The data which are perhaps most commonly used in estimating the adhesion of engines are those given in Molesworth's Pocket Book, which are as follows:

Adhesion per ton (of 2,240 lbs.) of load on the driving-wheels.

When the rails are very dry	600 lbs. per ton.
" " " wet	550 " "
In ordinary English weather	450 " "
In misty weather, if the rails are "greasy"	300 " "
In frosty or snowy weather	200 " "

If these figures are used it will be found that practically a locomotive will, at slow speed and under favorable circumstances, pull a heavier load, and that at high speeds it will not pull as much as the figures show that it should. When theory and practice do not agree, it is usually safe to infer that our theory is in some way wrong. That such is the case, or that some of the facts of our theory have been very wrong indeed, has been shown by the experiments recently made by Capt. Douglas Galton and Mr. George Westinghouse on the London, Brighton & South Coast Railway, the apparatus for which was illustrated and described, and some of the results obtained were given in the *Railroad Gazette* of July 26 of this year. In a paper recently read by Capt. Galton before the British Association, at the recent meeting in Dublin, he gives some further results which have great practical value.

It has for some time been recognized that "the frictional resistance to the commencement of motion, after two bodies have rested some time in contact, is greater than the friction between bodies of which one is already in motion upon the other;" but the law has generally been accepted that "friction between surfaces pressed together is in the direct ratio of the pressure, and is independent of the velocity." D. K. Clark in his Manual for Mechanical Engineers says: "Though the constancy of friction holds good for velocities not exceeding 15 or 16 feet per second, yet for greater velocities the resistance of friction appears, from the experiments of M. Poirée, in 1851, to be diminished in some proportion as the velocity is increased." These experiments were made on the Paris & Lyons Railroad "with a wagon, presumably having four wheels, of which the brake was screwed up, so that the wheels were skidded." The resistance to traction, or the friction on the rails, at various velocities, was as follows:

Empty wagon, 3.40 tons.	State of the Rails.			
	Dry.	Very dry.	Damp.	Dry and Rusty.
Velocity of wagon	Coëfficient of Friction. Weight = 1.	Coëfficient of Friction. Weight = 1.	Coëfficient of Friction. Weight = 1.	Coëfficient of Friction Weight = 1.
Miles per hour.				
9 to 14	0.208	.	....	0.201
14 to 18	0.179	0.246	. .	0.182
18 to 22	0.167	...	0.110	0.175
22 to 30	....	0.222	....	0.162
30 to 40	0.144	0.202	....	....
40 to 50	....	0.187	0.083	0.136

From these experiments it will be seen that the friction with a dry rail at a speed of 9 to 14 miles per hour is equal to a little more than one-fifth of the load, while at 30 to 40 miles per hour it is a little more than one-eighth.

The following table shows the result obtained by Captain Galton and Mr. Westinghouse by the sliding of the wheel on the rail, that is steel tire and steel rails:

Average speed. Miles per hour.	Coëfficient of friction at commencement of experiment to 3 seconds.
10	0.110
15	0.087
25	0.080
38	0.057
45	0.051
50	0.040

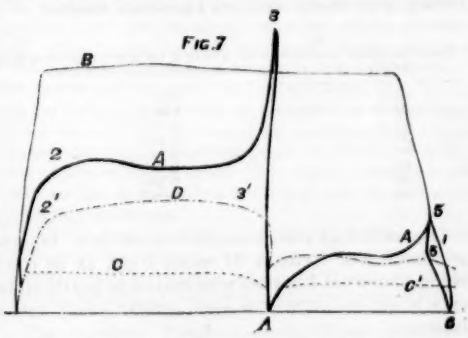
From these two tables it will be seen that the results obtained differ very widely, and that the coëfficients given by Poirée are almost twice as great as those given by Captain Galton. In one respect, however, they are both agreed, which is that *the friction diminishes* very rapidly *as the speed increases*, and therefore that the generally received idea "that friction is independent of the velocity" is wrong, at least if applied to the friction of car wheels on rails. This fact and the results of these experiments may very materially modify our data concerning the adhesion of locomotive wheels; and instead of being a constant quantity at all speeds, the amount of adhesion may in reality vary with the speed. By applying the coëfficients given in the two preceding tables, and calculating the adhesion of locomotive wheels and placing the results in the form in which Molesworth gives them, we would have the following table, in which the coëfficients given in the second column of Poirée's table are employed in making the calculation:*

* The coëfficient for a speed of 22 to 30 miles per hour and for 40 to 50 miles per hour not being given in this column, the approximate quantities 0.156 and 0.133 have been used in the calculations.

Adhesion per ton (2,240 lbs.) load on the driving-wheels:

From Poirée's Data.		From Galton and Westinghouse.	
Speed in miles per hour.	Adhesion.	Speed in miles per hour.	Adhesion.
9 to 14	465.9 lbs. per ton.	10	246.4 lbs. per ton.
14 to 18	400.9 " "	15	194.8 " "
18 to 22	374.0 " "	25	179.2 " "
22 to 30	349.4 " "	38	127.6 " "
30 to 40	322.5 " "	45	114.2 " "
40 to 50	297.9 " "	50	89.6 " "

The results given by Poirée's data at the slow speeds do not differ very widely from the data as given by Molesworth, but the Galton-Westinghouse experiments would indicate an amount of adhesion of only about half as much. But, as we have said before, it is found practically that a locomotive will draw a heavier load than calculations made with the Molesworth data indicate that it should. The question then is how, in the light of the experiments given above, can this be accounted for. This, it is thought, may be done if we recall the very common experience, that it takes more power to start an object in sliding than it does to keep it in motion after it is started, or, as this law is stated by Clark, "the frictional resistance to the commencement of motion, after two bodies have rested some time in contact, is greater than the friction between bodies of which one is already in motion upon the other," or as it is sometimes expressed, *static* friction is much greater than *kinetic* friction. Now the fact is that the adhesion of a driving-wheel to a rail, so long as it does not slip, is due to *static* and not *kinetic* friction, whereas the wheels of the cars or "wagons" on which the above experiments were made were sliding. It is very true that a driving-wheel rolls on the rails, and is therefore not at rest, but all the indications show that the adhesion follows the laws of *static* and not *kinetic* friction. This is indicated by the commonly observed fact that when a locomotive slides its wheels it will not exert nearly as much power to draw the train as it does just before the wheels begin to slip.



This was also shown in the diagrams published with the description of the apparatus used in making the Galton-Westinghouse experiments, one of which, fig. 7, is reprinted here. In this 1—1 is the datum line, and the

heavy line or curve *A* represents the "tangential strain;" that is, the downward pull which ordinarily would be exerted by the brake-blocks on the brake-hangers when the brakes are applied. This strain is dependent upon two things—the friction of the brake-shoes and the adhesion of the wheels to the rails. Thus, suppose only a small amount of pressure is exerted on the shoes, the strain would then be due to the friction of the shoes on the wheels. As the pressure is increased the strain is increased, until the former becomes so great that the wheels slide; then, obviously, no increase of pressure on the brake-shoes will augment the strain on the brake-hangers. If the wheels are locked so as to slide on a dry rail and should then come upon a greased track, the tangential strain would at once be diminished, although the pressure on the shoes remained the same. This strain, in other words, can never exceed *either* the friction of the brake-shoes on the wheels or that of the wheels on the rails, no matter how great the one alone may be. If, however, both of these could be increased simultaneously, it is plain that the tangential strain must also be increased. Now, by observing the curve *A* in the diagram it will be seen that it rises from 1 to 2 when the brakes are applied, the wheels continuing to revolve; presently, however, they stop and begin to skid or slide, and at that instant the pencil, which has marked the curve, flies up to 3, and drops again immediately after. This may be accounted for if we keep in mind the fact that at the instant that the brake-shoes stop sliding on the wheels and the wheels begin sliding on the rails, they are both in a state of *static* friction, and consequently the amount of their friction is at that moment *simultaneously* increased and is therefore shown in the curve by the sudden rise to 3 and an equally sudden fall immediately after. This shows that the adhesion of the wheels to the rails while rolling partakes of, if it is not identical with, the nature of *static* friction, and that therefore the coëfficients of the friction of of sliding wheels on rails are not applicable to a determination of the adhesion of driving-wheels. If the amount of the friction indicated by the curve *A* at the instant the wheels slide could be measured correctly from the curve, it would probably give us some reliable data from which the adhesion of wheels to the rails could be calculated. It is because the adhesion of driving-wheels either follows or partakes of the laws of dynamic friction, and is not governed by the conditions of sliding friction, that our locomotives pull more than our mathematics say they should.

The Galton-Westinghouse experiments also show that the friction of brake-shoes on the wheels follows the same law that governs the friction of the wheels on the rails, as might have been expected. The following table shows the more important results:

Speed in miles per hour.	Coëfficient of Friction between Cast-iron Brake Blocks and Steel Tires of Wheels.
5	0.360
10	0.320
25	0.205
30	0.184
40	0.134
45	0.125
50	0.100
60	0.062

The coëfficient with wrought-iron shoes at 18 miles per hour was 0.170, at 31 miles 0.129, at 48 0.110; being somewhat less than with cast-iron, but the difference is not so marked as some persons would have us believe.

The point which now needs elucidation is whether the rolling friction of the wheels on the rails follows the same law as sliding friction, or, in other words, whether it is diminished as the speed increases. Some of the diagrams taken should shed light on this.

Captain Galton concludes his paper by saying that "it may be assumed as an axiom that for high velocities a brake is of comparatively small value unless it can bring to bear a high pressure upon the surface of the tire almost instantaneously, and it should be so constructed that the pressure can be reduced in proportion as the speed of the train is reduced, so as to avoid the sliding of the wheels on the rails."

Axle Breakages in Germany.

Axle breakages are reported very carefully and minutely by some of the German railroads, there being a committee of the German Railroad Union which has the matter in charge. For the year 1876 it had reports from 24 railroad managements, which had altogether 190,263 different pieces of rolling stock—7,087 locomotives, 6,054 tenders, and 177,122 cars. Now, there was one axle broken in 1876 to every 590 locomotives, 242 tenders, and 2,725 cars, or one to every 1,865 pieces of rolling stock of all kinds. There has been a most astonishing decrease in the number of such breakages since the reports began in 1870, amounting to 68 per cent. since 1871, when an axle was broken to 592 pieces of rolling stock. It appears that tender axles suffer most, their breakages being eleven times as frequent as those of car axles. More than half of the breakages—54 out of the whole number of 102—occurred in the four coldest months, and five-eighths in the five coldest months—and this is true of axles under every class of rolling stock. The average life of the broken axles and the average distance run by them before breaking were:

Under—	Years.	Months.	Days.	Miles run.
Locomotives	11	0	23	162,854
Tenders	15	5	9	166,373
Passenger cars	17	7	4	342,737
Freight cars	13	5	25	109,604
All	13	8	10	137,941

The greatest mileage made by any one axle before breaking was 361,262 miles under a freight car on the Brunswick Railroad.

The committee's report gives the name of the manufacturer of each broken axle, its material (wrought iron, puddled steel, Bessemer steel or cast steel), and the cause of breakage when known. From this it appears that 74 of the 102 broken axles were of wrought iron, 9 of puddled steel, 4 of Bessemer steel, and 15 of cast steel. The proportion of steel and iron axles in use unfortunately is not given, but the committee says: "When we take into consideration that of late years most of the roads have used steel axles only for new rolling stock and renewals of old, and that they now form certainly a very large proportion of the whole number in use; further, that the axles of the new cars are much more heavily loaded, and finally that the manufacture of steel axles has had to be developed and perfected, and that many of the breakages of axles of that material were due to the faults of the period of development, we are justified in drawing a conclusion from the small number of failures of such axles favorable to the fitness of steel for axles."

Of the 102 cases of breakages, 42 were in trains going at full speed, 36 at reduced speed, 24 while stopping—the latter being mostly in consequence of hot journals. In former years the result has been quite similar.

The place of the fracture was in 57 cases in the journal, in two outside of the wheel-seat, in 25 inside of the wheel-seat, in 10 in the wheel-seat, and in 8 about the middle of the axle. Three of the axles were broken in more than one place.

A general statement of the causes of the breakages attributes 41 of the 102 to "ordinary wear," 30 to bad material and manufacture, 21 to hot journals, 5 to bad construction (sharp angles and insufficient dimensions), and the other 5 to various causes. "This table," says the committee, "teaches further, that the greater part of the breakages could have been avoided, either by the selection of a better material, by efforts to avoid hot journals and by the timely cutting out of the cars with hot boxes, as also by a more careful inspection of the axles for cracks." The committee also says: "It must be mentioned here that roads which give premiums for discovering cracks in axles have shown the best results, and the general introduction of the practice of giving such premiums is strongly to be recommended." One railroad gave 72 such premiums in 1876 and 99 in 1877, and that road—which is one of the most important in Austria—had *no* axles broken under cars while running, and, consequently, no accidents from broken axles.

Accompanying the report is a elaborate table of the 28 most noteworthy cases of breakage, giving date of breakage, time when the axle was begun to be used, the total mileage made before breaking and the mileage made since the last inspection of the axle, the kind of axle and the speed at time of breaking, its material and name of maker, its dimensions, diameters of journal and in wheel-seat, length of journal and in wheel-seat, and thickness of wheel, the place of fracture, with a cut for each one, showing the surface of fracture and the parts of this surface which were new and old, respectively; the standard load of the axle, the cause assigned for the fracture, the consequences of the breakage, with a column for remarks. This table puts before the eyes of the reader, as it were, all the broken axles and the circumstances under which each failure occurred.

Foreign Railroad Notes.

The Austrian Railroad Club recently made an excursion on the Western Railroad of Austria for the purpose of inspecting the following improved appliances recently introduced there: new Tiffany refrigerator cars constructed at Simmering Machine Works, the Hardy vacuum brake, a steam transfer table, a new superstructure intended as a substitute for ties, a blocking apparatus, and a Petri speed indicator. There were 400 members of the club who took part in the excursion.

A year ago the Russian Government required of each road in the Empire detailed drawings of all its rolling stock by the first of June last. Not one company is ready with its drawings yet, but some have a very good excuse to offer, because of the vast variety of their cars. The St. Petersburg & Warsaw road has 80 kinds of cars and the Baltic road more than a hundred. The latter absorbed the first Russian road and is still using the cars of antediluvian pattern which were first in use on it. The Government album is likely to be one of the greatest curiosities in the annals of railroads, but it will probably be much more curious than valuable in other countries.

On the Austrian railroads in 1877, with 6,861 miles in operation, there were 1,096 accidents, which was 232 less than in 1876. Of these 198 were derailments, and 58 collisions. There were 319 cases of damage to rolling stock, 395 of injuries to men and animals, 37 cases of running over animals and vehicles. The number of persons killed was 151; of injured, 288, and 15 of the latter were passengers.

The Austrian iron works count on a great demand on them for railroads to be constructed in Turkey, or the provinces lately belonging to that country. They count that about 100,000 tons will be needed within three years, and they want the orders for rails exclusively for themselves. Most of the proposed lines begin on the Austrian frontier even if they are not on Austrian territory; but rails can be taken from England, Belgium or Germany around by the Mediterronean to Constantinople and Salonica, and thence to the western termini of the existing Turkish railroads, and as there is a vast grain traffic from the Bosphorus to England and very little to fill the vessels going back, probably rails would be delivered at the Turkish ports at a trifle more than their cost in England.

Of 18,151 miles of railroad in operation in Germany in 1876, 8,792 miles were the property of governments, and worked by them, 1,907 miles were the property of corporations, but worked by governments, and 7,452 miles were owned and worked by corporations. Thus, 10,699 miles, or nearly 60 per cent. of the whole mileage, were worked by governments. On an average 298 miles of road were worked by one company or management, the practice in Prussia with goverment railroads being to have a seperate management for each railroad, and not a single management for the whole system of government roads, as is the case in Belgium. Of the whole mileage, 32⅛ per cent. only was double-track railroad; but this greatly exceeds the proportion in Austria-Hungary, where but 9¾ per cent. of the roads were double-track lines in 1876.

The cost of the German roads in 1876 had been at the average rate of $100,596 per mile, varying from $171,600 down to $23,546 per mile on different roads.

The electric light, one of the earliest uses of which was for lighting railroad stations in Paris, has been applied for the illumination of the railroad shops at Kiev, in Russia, and is said to have proved cheap as well as otherwise advantageous.

A German newspaper which is credited with being officially inspired in speaking of the project for the purchase of railroads by the Empire denies that the plan contemplates the absorption of all the private railroads by the government; what is now to be aimed at, it says, is the formation of an imperial system of roads in order to establish national unity in the domain of railroad transportation; and it is not impossible that the management of these imperial roads may be left, under certain fixed regulations by the Empire, to the several State governments. That there may be some time a further development of the imperial system is not impossible; but that is not now required, and the government purposes to provide only for the needs of the present. "The continuation and the proper development of private railroad business is not excluded by the railroad project of the Empire."

Servia has made use of its newly acquired independence to pledge itself to Austria to construct within three years and to work in the manner of the best managed Austrian roads a railroad from the Danube at Belgrade south by east about 140 miles to Alexinatz, near its southern border, in the direction of the railroad now in operation from Constantinople northwestward.

Passengers' Baggage.

Mr. C. P. Atmore, of the Louisville & Great Southern, in his very interesting, practical and suggestive address at the Chicago meeting of the General Passenger and Ticket Agents' Association, proposes to abolish the practice of allowing a certain amount of baggage to be carried free, and to charge for everything that goes into the baggage car. It seems somewhat strange that there ever should have been any other practice, and the inequality and injustice of the present plan was pointed out by us last winter in comments on some chapters of Kirkman's "Baggage Car Traffic," then published in these columns. Some passengers between New York and Chicago get a hundred (or more) pounds of freight carried at express speed nearly a thousand miles, besides their own passage, for their twenty dollars; others get only themselves carried. There is no inducement whatever for the passenger to "travel light" except the simple saving of trouble in getting his checks, and the city express charges on trunks. Our baggage comes from San Francisco to New York, about 2,500 miles, without one cent. of expense for the rail carriage; but it costs half a dollar or more to have it taken half a mile or so to and from the train on starting or arriving; and but for this probably a great deal more merchandise of various kinds would be carried as "passengers' baggage" than there actually is now. But we do not agree with Mr. Atmore that it would be easy to make the change. Free carriage of baggage has been so nearly universal for so long a time that it has come to be looked upon as one of the inalienable rights of travelers. The practice has been growing more instead of less common, moreover. The English railroads, or nearly all of them, allowed free baggage from the beginning; but the French railroads did not, we believe, for some years after there was a considerable system of roads in that country, and in Germany all baggage had to be paid for until quite recently. The extension of the practice has apparently been in satisfaction of a strong, if unreasonable, popular demand. But if baggage is to be allowed free carriage, the quantity should at least be strictly limited to a moderate amount, and a charge be rigorously collected on all excess, which charge should certainly not be less than double first-class freight rates. This is done in every country except this. In England we believe the amount allowed varies according to the class of the ticket bought; at one time it was 112 lbs. for first-class, 84 lbs. for second, and 56 for third. In France 66 lbs., and on most of the German and Austrian roads 55 lbs. are allowed. And on the Continent every piece is weighed, even if it is evidently lighter than the maximum

allowance. Here we do—or leave undone—everything to save time and labor, and weighing is not often practiced, it not being thought that the revenue from extra baggage would be worth the trouble connected with it, and station men in a hurry preferring to do business in the easiest way and have the least possible controversy with passengers—which also accounts for the practice formerly common on so many roads (and probably not yet obsolete on some) of checking any trunk offered for any place without requiring the production of any ticket. Of late, it seems, a practically unlimited allowance of free baggage has been one of the inducements which agents have offered to divert travel from competing roads, so that on certain routes at certain times of the year there needs to be about as many baggage as passenger cars in a train, and a passenger's baggage at express rates would amount to about as much as his fare. Of course, if this practice continues, passenger trains will be largely used for carrying freight. Passengers who have no baggage of their own to carry will get something else, in order to gain the full benefit of their privilege.

Record of New Railroad Construction.

This number of the *Railroad Gazette* contains information of the laying of track on new railroads as follows:

St. Joseph & Des Moines.—The first track is laid from St. Joseph, Mo., northeast 14 miles. It is of 3 ft. gauge.

Memphis, Kansas & Colorado.—The first track is laid from Cherokee, Kan., west to Parsons, 25 miles. It is of 3 ft. gauge.

Baltimore & Hanover.—The first track is laid from Black Rock, Md., southward 2 miles.

Atchison, Topeka & Santa Fe.—On the *Southern or New Mexico Extension*, track is extended west by south 38 miles, to Trinidad, Col.

Kankakee & Southwestern.—The first track is laid, from Otto, Ill., westward 8 miles.

Marietta & North Georgia.—The first track is laid, from Marietta, Ga., northward 10 miles. It is of 3 ft. gauge.

Springville & Sardinia.—The first track is laid, from the junction with the Buffalo, New York & Philadelphia west to Sardinia, 2½ miles. It is of 3 ft. gauge.

Central Pacific.—This company's *Northern Railroad* is extended from Williams, Cal., northward to Funk's Slough, 18 miles.

This is a total of 113½ miles of new railroad, making 1,273 miles completed in the United States in 1878, against 1,223 miles reported for the corresponding period in 1877, 1,556 in 1876, 746 in 1875, 1,025 in 1874, 2,507 in 1873, and 4,623 in 1872.

AUGUST GRAIN RECEIPTS at New York have been as follows for the past two years:

	1878.		1877.	
By Rail:	Bushels.	P. c. of total.	Bushels.	P. c. of total.
New York Central	5,352,768	35.2	1,672,921	16.8
New York, Lake Erie & Western	2,503,790	16.5	1,098,992	11.0
Pennsylvania R. R	1,812,557	11.9	425,543	4.3
Other roads	18,406	0.1	3,060	....
Total by rail	9,687,521	63.7	3,200,516	32.1
By Water:				
Canal	5,468,584	35.9	6,600,735	66.3
Coastwise	65,793	0.4	155,847	1.6
Total by water	5,534,377	36.3	6,757,582	67.9
Grand total	15,221,898	100.0	9,958,098	100.0

It thus appears that the whole (and more, too,) of the increase of the receipts at New York, amounting to more than five millions of bushels, was brought by the railroads. The New York Central alone this year delivered nearly as much as the canal. Its August deliveries were this year three and one-fifth times as great as last year, the Erie's nearly two and a half times as great, and the Pennsylvania's nearly four times as great, and meanwhile canal deliveries fell off more than a sixth. Even in 1876, when the railroads were carrying at extremely low rates and competed with the lakes more effectively than at any other time before or since, they brought but 38.3 per cent. of the August receipts in New York, which in amount was but 1,686,137 bushels, or little more than one-sixth of what they have brought this year. The canal, however, this month has been recovering its superiority, and a large part of the grain delivered by rail in August was, it must be remembered, taken at extremely low rates, the advances of Aug. 1 and Aug. 19 affecting only the grain which was shipped after those dates, but which did not arrive at New York until a week or two later, according as it was forwarded by lake-and-rail or by all-rail routes. And, indeed, the advances then made did not apply, or not to their whole extent, to the lake-and-rail shipments, on which since that time it has been agreed that rates may be made freely without any reference to all-rail rates. That the greater part of the receipts in August were by lake and rail may be judged by the fact that the rail receipts then were nearly twice as great in amount as the rail shipments from the eight Northwestern markets, not nearly all of which, surely, was sent to New York.

FLUCTUATIONS IN TRAFFIC are a source of trouble to carriers as fluctuations in rates are to shippers. The railroads feel the fluctuations of traffic, and receive most of the blame for fluctuations of rates. But the shipping has greater variations in traffic, and makes greater variations in rates. As an instance take the lake vessels engaged in the grain business. There is a great fleet of vessels which depend almost solely on this business, the vessels carrying lumber being mostly of a different class, and largely of lighter draft, to enable them to enter lumber ports with less water than the great grain ports. Now this year, when there may be said to have been a heavy grain traffic all the time, the shipments by lake have varied from 1,747,564 bushels to 5,444,323 bushels per week, and last year the week's shipments several times fell below 1,500,000 bushels, and once were as low as 1,239,288. Imagine a railroad with no business but freight and that freight varying from 516 to 2,270 car-loads daily, and that would be something like the traffic of the lake grain vessels, except that the latter usually work but seven months of the twelve. But they exceed in fluctuations of rates as well as of business. This year, even, lake rates were advanced 233 per cent. within four weeks, which is as if the present 30 cent rate of the railroads had been advanced to $1 between the 19th of August, when it was established, and the middle of September. And a similar advance was made in ocean steamer rates last year between the first of July and the last of August. The enormous capacity of the lake fleet has never been so well demonstrated as during the past few weeks. In the three weeks ending with Sept. 7 more than 15,000,000 bushels were carried from Western lake ports by rail—enough to have loaded about 36,000 railroad cars. It is true that a considerable portion of this was carried the short distance of about 250 miles from Detroit or Toledo to Buffalo, instead of the long distance of more than 900 miles from Chicago or Milwaukee. At this rate the lake fleet alone in the usual season of navigation could carry eastward 150,000,000 bushels of grain. And the presence of this vast fleet of grain-carriers—enough to carry 5,500,000 bushels, when often less than a third of that quantity is offered—explains why lake rates have been extremely low most of the time of late years, and why the railroads can get grain to carry only at very moderate rates while navigation is open.

WATER RATES show a little change during the past week, lake rates having tended to decline, most of the time being quoted at 4 cents per bushel for corn and 4¼ for wheat from Chicago to Buffalo, but more than once a quarter of a cent lower. Canal rates, however, advanced after Sunday, and are now reported at 8½ cents for wheat, 7¼ for corn, and 5⅝ for oats from Buffalo to New York, against 8, 7 and 4¾ a week ago; but rail rates from Buffalo to New York remain unchanged at 8, 7½ and 5—lower for wheat and oats than by canal, which is due probably to the presence of a full supply at the seaboard and the desire of shippers to get as much storage as possible *en route*. The water rate from Chicago to New York, including transfer at Buffalo, is now about 14 cents a bushel for wheat, while the all-rail rate is 18 cents. The shipments through by rail are not large in proportion to the whole amount of the business from the lake ports, but the rail shipments from Buffalo are large, though smaller than they were a few weeks ago.

Ocean rates by steam to Liverpool have fallen again, and were quoted Tuesday last at 5½d. per bushel, which is just about half the prevailing rate a year ago. Rates by sail to Cork for orders and to French ports, however, keep up about to what has prevailed for months—something like 9d. per bushel, and scarcely ever so much as ½d. less to Cork for orders. To Havre 20 cents a bushel is paid, while 11 cents is accepted (by steam) to Liverpool. Sail rates vary much less than steam rates, as the sailing vessels go wherever they can get cargoes on the most profitable terms, while the steamers sail on regular routes and at pretty regular intervals. Thus the sail rates are governed by the aggregate demands of the world for ocean tonnage, and the steam rates by the demand only of the several routes on which they run. Just now there appears to be an excess of tonnage running to Liverpool, but a demand for the whole capacity of the steamers to Havre, so that the rates on routes nearly parallel and of nearly the same length are in the proportion of 11 to 20. Cotton rates keep up about as high as they have been of late years (¼d. per pound to Liverpool), but provisions are low, generally about 25s. per ton. Before this year they were rarely lower than 40s.

THE PULLMAN PALACE CAR COMPANY REPORT is the fourth that has been made public. For the year ending with July last, the earnings, expenses and profits were all smaller than for any other of the four years, the figures being as follows, those headed "surplus" being the actual earnings of the stock, out of which dividends were paid and an undivided surplus accumulated:

	Revenue.	Expenses.	Profits.	Interest, rentals, etc.	Surplus.
1874–75	$2,558,647	$983,346	$1,575,301	$550,357	$1,024,944
1875–76	2,555,011	990,210	1,564,801	514,269	1,050,532
1876–77	2,570,639	985,072	1,585,567	493,579	1,091,988
1877–78	2,160,830	878,578	1,282,252	451,866	830,386

The net earnings (profits) were remarkably uniform for the first three years, but last year were nearly a fifth less than in any previous one. But the company has been decreasing its fixed charges by paying off bonds, etc., so that these charges in the four years have been reduced $100,000, and with last year's reduced profits were but 35 per cent. of the net earnings, so that the decrease in the surplus available for dividends in the four years has been less than $200,000. From 1877 to 1878, however, this decrease was $260,000, or 24 per cent. Reduced as it was, however, it was equivalent to nearly 14 per cent. on the company's stock; though but 8 per cent. was actually divided. The company has been accumulating a large surplus, which now is reported to be nearly $3,500,000, which is equal to 40 per cent of the company's capital, and is a million dollars more than its funded debt. Of this surplus, $615,000 is invested in sinking funds and the rest in the property of the company. The increase in the surplus last year was about $350,000 against $620,000 the previous year. The $115,000 stolen by the absconding Secretary, Angell, goes into the current year's accounts, the loss having occurred since July. This loss is nearly equivalent to 2 per cent. on all the stock—a quarterly dividend. There was very little change in the property or capital of the company during the last year, the stock of cars remaining 460, and the funded debt very little reduced. It is now less than 30 per cent. of the company's capital and at the rate of but $5,145 per car owned.

THE RAILROADS AND THE CANAL show strange fluctuations in the quantities of grain brought by them, respectively, to New York since last July, as witness the following statement of the receipts weekly for seven weeks past:

Week ending—	Canal.	Railroad.	Total.*	P. c. by rail.
Aug. 5	1,051,909	2,029,827	3,081,736	66
" 12	1,260,776	1,787,804	3,048,580	59
" 19	1,002,424	2,486,398	4,488,821	71
" 26	1,147,158	2,329,162	3,476,320	67
Sept. 2	1,512,009	2,193,013	3,705,022	59
" 9	2,547,939	1,684,774	4,232,713	40
" 16	2,838,426	1,617,940	4,458,078	36

* A little is received by coasting vessels, which in all but the last two weeks is credited to the canal in this table.

The decrease in rail deliveries is probably due to the action of the railroads themselves, for the difference between rail and water rates has been constantly decreasing since Aug. 19, not by the decrease of rail rates, but by the advance of water rates; the railroads, however, perhaps have maintained their rates more firmly of late, as their rolling-stock has been fully occupied.

The enormous increase in canal receipts recently indicates that the higher rates have brought out all the available boats; but what is more remarkable is that, with the increase in capacity offering, canal rates have continued to advance, though rail rates have been nearly stationary, and are now lower from Buffalo than canal rates. A very large proportion of the grain which the railroads take from Buffalo in competition with the canal, however, goes to New England, and not to New York city; but we know of no reason why these interior deliveries should be a larger proportion of the whole now than they were in August.

At current rates the earnings on the haul from Buffalo to New York on the grain delivered at the latter place by the railroads last week were about $209,000. In August 55 per cent. of the deliveries were by the New York Central, 26 per cent. by the Erie, and 19 per cent by the Pennsylvania—which latter, of course, did not carry from Buffalo.

A NEW FREIGHT WAY-BILL has just been adopted by the German Railroad Union, after four years of discussion and negotiation. A great number were proposed, but those which suited the railroads sometimes did not suit the governments, and this was complicated by the fact that there are Belgian, Dutch, Roumanian and Russian roads in the Union, as well as German and Austrian-Hungarian, and it seems that each country requires certain entries to be made on way-bills—at least on those of shipments which enter from foreign countries—and to contrive a form which would serve for all shipments, would not require writing on both sides, and would require but a moderate amount (these words taken in the German sense) of writing, was a task of no little difficulty As adopted this "simplified" way-bill is a sheet 11⅝ × 14⅝ in., or about the size of a leaf of the *Railroad Gazette* (half an inch wider and half an inch shorter), which is to be white for ordinary freight and dark rose for express freight. There are places on it for four stamps, besides those made in transferring the freight from one road to another, which go on the back of the way-bill, and blanks for 29 written entries, some of bare figures and some of remarks and instructions which may take several lines, besides the blanks for the address of the consignee. Not every shipment requires all these blanks to be filled, but in any case the clerical labor must be considerable.

A Berlin printer takes occasion to advertise on the model sheet sent out to the companies, that he will furnish the freight (white) way-bills at the rate of 91 cents per thousand, and the fast-freight (red) ones at 97 cents per thousand.

THE GENERAL PASSENGER AND TICKET AGENTS' ASSOCIATION, we understand, voted down all the propositions made looking toward the carrying out of the resolution of the Saratoga conference in favor of abolishing the payment of commissions on ticket sales and the maintenance of outside agencies for securing passenger business. A simple majority vote, however, would not have been sufficient to secure the adoption of that policy: for that practical unanimity is required. But a majority vote would probably have had a good deal of effect on the hesitating and reluctant companies. It is important that the reforms proposed should be introduced at the earliest possible moment, but it is probably true that there are many roads which cannot hope to maintain as large a through traffic as they have had, if they do not in some way makes unusual exertions to get it, or have some arrangement with their competitors concerning it. On the other hand, it may be said that to some of these roads their through passenger traffic is not worth having—that it costs more than it comes to—and if the cost of through passenger business were exactly reckoned, we fear that this would be true of some roads which do not make extraordinary exertions to get it. Average trains of five or six cars weighing 20 or 30 tons apiece and with average loads of six or eight passengers per car—and these can be found—carried at a cent and a half or two cents per mile at fast speed, are likely to show a balance on the wrong side.

RUSSIA IN ASIA has this year been invaded by the railroad, and construction trains are now running over the Ural Mountains to the city of Ekaterinereburg, just on the

Asiatic side. This place is in about latitude 57 and in longitude 60 degrees east of Greenwich, that is, about a hundred miles further north and 800 miles further east than Moscow—as far north as Aberdeen and as far east as the head of the Indian Ocean. There is now on the Eastern Continent a continuous line of railroad from longitude 10 west to 60 degrees east of Greenwich, the western terminus being south of latitude 40, and the eastern about latitude 57. This exceeds the extent of the North American system from about 46 west of Greenwich (Halifax), to 105 west (San Francisco). The European system covers 70, the North American 59 degrees of longitude.

The railroad enters Ekaterinereburg from Perm, which is about 190 miles northwest (by an air line), and in that inland and elevated district must have a very severe winter. It is not quite so far north as St. Petersburg and the Finland railroads, but the latter have the winters somewhat modified by the nearness of the Baltic sea; while Peru has no sea nearer than 800 miles, and that is the Arctic, and the Ural range is close by. The road from Perm to Ekaterinenburg, 310 miles, was to be opened to the public Sept. 1, and a good deal of work has been done on an extension of the road into Siberia.

THE METER-GAUGE IN INDIA is claimed by the *Civil and Military Gazette* of that country not to have fulfilled the promises of its advocates. It was to be very cheap; but the average cost per mile of the Holkar Neemuch meter-gauge road has been so far $49,060. It was to be profitable; but this road in the last half of 1876 had net earnings of less than $33 per mile. It was to afford cheap transportation; but the average charge per ton per mile on this road was 3.89 cents, while on the costliest of the broad-gauge (5 ft. 6 in.) railroads of India the average was but 1.83 cents, or less than half as much. The narrow-gauge road has thus not been cheap to construct nor cheap to work. As the *Indian Railway Service Gazette* says: "Narrow-gauge railways in India are far more expensive to work than broad-gauge lines, for the very simple reason that a freight train costing nearly as much for fuel and oil, and requiring nearly as many men to man it, can only carry one-third the load of a broad-gauge train." This gives Mr. Fairlie a chance to say that this is all due to the neglect to use his double-truck engines on the narrow-gauge road; and that will give others a chance to rejoin that the train-loads of double-truck or other exceptionally heavy and powerful engines on narrow-gauge roads would compare just as unfavorably with those of the same kind of engines on broad-gauge roads. A big train-load is essential to the cheapest working.

RUSSIAN RAILROAD SALARIES seem to be very comfortable—that is, for the chief officers; for the wages of the employés are doubtless enough lower to make up for them. A recent Russian official publication shows Mr. von Meck, of the Landvorovo-Romny road, received altogether $31,500 "exclusive of commissions;" Mr. Adadurov, of the Moscow-Rjasan and the Rjasan-Koslov, $51,500; Mr. J. von Derwis, "including commissions," $55,000. A German railroad paper (which seems not to love the Russians), in presenting these figures, says it does so chiefly as a basis of comparison with German salaries, and adds: "But may heaven keep our conscience free from leading any one whomsoever from entering the Russian railroad service!"

THE NEW YORK ELEVATED RAILROAD TRAFFIC was stated in these columns last week to have been 3,204,820 passengers for *eleven* months of the current fiscal year. This was the traffic of *ten* months, making the average daily traffic 10,542 passengers per day. The increase over the traffic of the corresponding period of the previous year was correctly stated to have been about 30 per cent.

THE LIVE STOCK APPORTIONMENT, which was agreed upon a few weeks ago and took effect Sept. 2, is effected, as the previous one was, through the intervention of "eveners;" but these are paid ten dollars instead of fifteen per car-load for making and insuring the distribution.

Needed Reforms in the Conduct of Passenger Business.

[Address before the General Passenger and Ticket Agents' Association at Chicago, Sept. 13, 1878, by C. P. Atmore, General Passenger and Ticket Agent of the Louisville & Great Southern Railroad Line.]

I am sorry to rise as an apologist, but when I review the various interesting essays due, in creation, to the best minds in this body, I find it almost impossible to deliver an address without going over ground which has heretofore been cultivated. Virgin soil in this regard is hard to find. Therefore, I am compelled to tell you at this the eleventh hour that you, in selecting me for this important position, and I, in accepting the same, both make mistakes; but as the fault is yours, you must bear with me, for I will detain you but a few moments, suggesting some advancements in conducting our business and pointing to some of the evils under which we labor, which, if duly considered and acted on in the right spirit, may lead to advancement. "Are we advancing?"

The question which agitates not only the minds of the officers of railroads, but the minds of gentlemen who have invested their money in their construction, is, "Can railroads in this country be managed so as to be remunerative?" And it would seem that if, in their sagacity as moneyed men, they have been able to accumulate millions to invest in railroad stocks and bonds, the same sagacity would hold good in the control and management of railroad affairs to a beneficial end. But unfortunately this does not appear.

The fact exists beyond the power of any successful contradiction, that we have advanced, and that very beneficially, in the last few years, in the management of our coupon-ticket system, and have placed great restrictions against fraudulence and speculation in the same. I doubt not that our coupon system is far superior to that of any other country, and that in this it may be said that we have almost reached perfection; but it is left for us yet to seek other modes to benefit the corporations we represent, and, if possible, increase the revenue without an increase of service.

PAYMENT SHOULD BE REQUIRED FOR ALL BAGGAGE.

The baggage system now in use upon railr ads on this continent is unjust and unprofitable, and will remain so until an entire revolution is effected, and the present mode of conducting it is abolished. When I say unprofitable, I speak of the majority of lines here represented.

I have said it is unjust. Let us look at this point a moment. Mr. Jones, receiving a telegram that business calls him immediately to Boston, goes to the nearest railway office, and, purchasing a first-class ticket, and securing sleeping-car accommodations, is off for his destination, with baggage consisting of only a small satchel. He is our best customer, and makes more mileage over rail lines, ten to one, than his more affluent neighbor, Mr. Lovejoy, who has retired from business, and wants rail transportation only once yearly, when seeking the seaside, or some fashionable watering place, with his family. The latter gentleman calls at the same office and says to the gentlemanly ticket agent that he is going to Newport with his wife and daughter. The party behind the counter goes on to explain the beauties of his route, direct connections, and that he has less changes, etc., than any other line, and satisfies Mr. Lovejoy that it is the best line for him to take, and is informed by him that he will call to-morrow and secure his tickets. Just before leaving the office he carelessly says: "Well, how about the baggage? Do you send to the house and check it? I have five pieces." "Yes, sir; oh, yes; we will see that it goes through all right, without any extra charge."

This is similar to what is known to occur in our principal city ticket-offices daily.

Query: Is the money of Mr. Lovejoy any better than that of plain business Jones, or why should railway companies transport, from the initial point to Boston, five hundred pounds of baggage without remuneration, and charge Jones as much as they do Lovejoy for passage? Is there any good reason why passengers should not pay for the transportation of their baggage? Will this additional cost stop the traveler and cause him to seek some other mode of conveyance?

Radical changes in long-established customs are hard to effect, and I am well aware of the violent opposition this proposition will meet with. It may be looked upon as an arbitrary measure at first, and the movement be denounced as such; but its justice to all classes of travel will be seen. Why should railroad companies haul one or two ponderous baggage cars on each train without revenue arising from such service? You say that the price of a ticket includes the baggage of a passenger. If this is so, then why not pay Jones a rebate because he takes with him a satchel only? But, we would ask: Is there any state or general law that makes it obligatory on rail lines to transport one hundred pounds for each passenger carried, except the law of custom? And if this custom is detrimental to our interests why not abolish it? Jones does not require the station or train baggage-master to check his baggage, and if lost, Jones alone is responsible; whereas, the five hundred pounds of Lovejoy are checked through. One piece being missing, suit is brought for any amount from $100 to $1,000, and it is proven in progress of the trial that the trunk so lost contains the most valuable wardrobe of the entire party.

In this, we say, it is unjust; it is unprofitable, as now conducted, to all lines, but more especially to many that may be termed middle lines, that in themselves, do not originate much travel, but form part of a through line, and are checked over from each end, and against all protest cannot persuade lines from whom their principal through business comes, to report any proportion of the moneys collected on excess baggage.

Sir, this convention has been passing resolutions in regard to this matter of reporting extra baggage since its infancy, and in this regard has accomplished nothing. I am of opinion that the day is not far distant when the passenger will purchase his ticket, and if he has baggage, will purchase a ticket for that also, by the same route as his passage ticket reads. This system once inaugurated, we will be rid of one of the fruitful causes of cutting rates, for it is as easy to cut rates by carrying free of charge an extra amount of baggage as it is to reduce the price of a ticket. Then the baggage will be transported over the several lines by which the passenger goes, each one receiving its due proportion for services rendered. The passenger will not go by one line and his baggage by another, and the ponderous baggage car will thus be a source of revenue instead of expense.

There is no trouble in taking this step. We are now working on an ancient custom, not so old either. The day is not beyond the memory of some of you, when eighty pounds only was allowed, and the passenger was as well satisfied then as now, when some of us are carrying all he wants taken, and advertising the fact to the world, checking almost anything except live stock. Locally, each line can regulate its own action, but on through-coupon business, where baggage is checked over other lines, this system should go into effect throughout the entire country. With hearty good will and coöperation it can be inaugurated in sixty days, and without coöperation any system for advancement must fall to the ground.

CUT RATES AND HOW TO AVOID THEM.

Since our harmonious meeting at Jacksonville, the press has announced throughout the length and breadth of the land, "Rates reduced!" "Another War in rates!" and "Rates still lower!" in startling head-lines. They are truly startling to him who by frugality and prudence had made a competency, and placed it in a railroad security. Not startling, however, to the passenger who finds that he has business that takes him in that direction, on his first knowledge of the cut having been made. Oh, no; not startling to him. There is a cause for these cut rates. They take place too often to come by chance. What is the cause, and can it be removed? It is an indisputable fact that certain lines have advantages over certain other lines. From their geographical position, construction, equipment, etc., the lines naturally carry the bulk of passenger trgffic between the points so situated. The poor or less attractive line, in common parlance, has "no show." Then, to get a business they have not and cannot secure at established rates, they cut the rates and an utter demoralization of the passenger business ensues. This plain statement of facts every member of this convention knows to exist.

Is there a remedy? We think there is. By making all lines interested in the maintenance of rates, or in other words, selling round-trip tickets good going one way and returning another, at a moderate reduction from the rate both ways. Or, in perhaps plainer language, letting the stronger give the weaker line a chance. Will this action accomplish the desired end? And will not the ticket suit the wants of many travelers? We have but one short experience in this style of ticket—but one light to guide us. It was in this way that during the Centennial we were able to maintain rates, and I do not know of a rate being cut south of the Ohio River during that period.

A railroad line, no matter how poor it may be, or under what disadvantages it labors, must be recognized. Its construction may not have been the acme of wisdom, but nevertheless it is there, and until removed, or a purchase forced by its continued demoralizing influence, will be a thorn in the side of its more opulent opponent. You cannot ignore it. If you do, you only bring about a demoralization of business. The stronger lines must make some concessions to the weaker lines, and in placing this round-trip ticket on sale, all lines become interested.

These matters should secure our most earnest, careful attention. If this plan is not feasible, and there are any arguments against it, what plan can be adopted outside of a general pool that will hold passenger rates steadfast? Does this intelligent body propose saying it can't be done? No, sir; let us try every measure and never give up until all fail.

TOURIST TICKETS.

In this connection it may be well to speak of tourist travel. If the tourist ticket is a proper investment, and if it increases the volume of travel (and it certainly can be made to do so), why should not the lines themselves perform the service of selling these tickets without the aid of any outside agencies?

It is my opinion that if we were to inaugurate the tourist ticket, allowing the passenger to take in all the points he may wish to visit and the liberty of returning by any of the various lines to the point from which he started, at a stipulated rate per mile less than our tariff rates, it will increase business and also tend to the maintenance of rates. It is something so simple in its management, and so easy to inaugurate, that it is almost useless to mention it. One coupon printed for each line in the country answers the entire purpose.

Can we advance sufficiently to shut out the professional excursionist, who is another fruitful cause of disturbing rates? Can we stop farming out our trains where individuals alone are profited, and the railroad companies alone the losers? These professional excursionists and land agents have grown to an alarming number in the last few years. There is scarcely a town, village or station in the north and east where one or more of them may not be found, who live on railroads, sucking their life's blood. Having failed in all pursuits where honest industry was required, they make a competency from our weakness. These words may sound harsh, but they are facts.

NATIONAL LAW FOR INTER-STATE TRAVEL.

There is another proposition for advancement in coupon business that strikes me as being worthy of attention: and that is the enactment of a general law that will define the rights and privileges of parties holding through coupon tickets that pass through several states.

Mr. A purchases a ticket in Boston to go to Galveston, passing through several states, each having its peculiar law in regard to the duties of a common carrier, and if there are any irregularities about the ticket, or any loss or damage to his property, does he gain redress by the laws of the state in which it happened, or by the laws of the state in which his ticket was purchased.

I would suggest that, as Congress has the *exclusive power* to regulate commerce among the several states, and as this coupon business in a large majority of cases is inter-state commerce, the various lines petition Congress to pass such a law or laws as will clearly define the redress of the carrier and the carried on tickets sold through two or more states. To this end, would it not be well for this body to pass a resolution requesting our presidents to instruct their several attorneys to meet in convention, at such place and time as is most convenient, and draft a bill covering these points to be sent to Congress, urging our several representatives in that body that it be made the law of the land? This, I think, would be beneficial, so far as coupon business is concerned. We would then act with authority in ejecting from our trains, or collecting local fare from parties traveling on stolen or spurious tickets, and know exactly our duties and privileges in each case, as the law in regard to all questions of this kind would be general. There is light needed on this subject to intelligently conduct our business. Now, we are groping in the dark, in midnight darkness in all such cases.

CUT-THROAT COMPETITION.

Can unremunerative competition cease? If we would stop working for that which does not properly belong to us, in fact, have no just right to compete for, simply because we wish to take it from the line to which it does properly belong, we would see beneficial results. By this I do not advise and would not be understood as advising against strong and earnest competition on all business that will pay, setting forth in a strong and lucid manner all the advantages you possess, and using all honorable means to secure the business, but I refer to that class of competition that takes travel away from a line where it would pay, and sends it by a circuitous route, bringing the line so transporting in debt, when all expenses are paid. We admit the travel properly belongs to A, but the argument is if we can get it at half a cent per mile it is so much money made, not thinking that A will retaliate when the opportunity occurs, and when we should have paying rates he takes the business at about the same figures we used on him, and away goes the revenue on what we consider to be our business proper.

How far this competition should be carried and at what point it should stop must be decided by each separate representative. I am sorry to say it exists in this body to an alarming extent, and to the detriment of lines in interest, proving injurious, rather than beneficial, when indulged in.

These advancements may be claimed by some to be chimerical and cannot possibly be effected. The only question is, would they be beneficial? If so, they can be put in effect. It is true they cannot without concert of action. Now comes the question: Can we have concert of action? I claim we can, if, as hereinbefore stated, the strong lines will grant some concessions to the weaker lines, and not endeavor to crush them out.

There is not a president or general manager in the land, but when these propositions are placed intelligently before him, will see the moneyed benefit to the line he controls, and, seeing it, will give such orders as will tend to its *rigid enforcement*.

Mr. A places his money in manufacturing, B in merchandise, C in mining operations and D in railroads. Why should not the property of D be as closely guarded as that of A, B or C? Do any of these gentlemen with capital so invested allow their employés, on the slightest provocation, to sell their wares for less than cost? No, sir. It would be considered madness. Yet here, where we represent millions of capital placed in railroad stocks by people in all conditions of life—the widow's dower and the orphan's all—even a rumor is taken as substantial proof, and, without consultation, away go rates.

The day is fast approaching when parties who hold these rail lines in their pocket will demand a like management of their interests.

We are employed to secure the greatest amount of revenue possible to our several companies, and it is plain that this cannot be done by strife and warfare; nor can it be done without concessions on all sides. Lack of confidence in business integrity is a painful cause of much loss. Unanimity of purpose, to sink narrow and personal views for our general good, should animate us; and from this good results will spring.

The Examination of Trainmen.

In the course of an examination into a recent serious accident, Mr. J. H. Barrett, Superintendent of the Pittsburgh Division of the Pittsburgh, Cincinnati & St. Louis Railway, gave the following testimony as to the practice of the company in the appointment and promotion of trainmen:

As a rule we promote to conductors and engineers from brakemen and firemen. Whenever any man enters the service of the company we furnish him with a time-table on which is printed time of all trains, and all general and special rules governing the movement of trains and employés. We manage our employés on about the same principle as the army is managed. We promote the conductors and engineers from brakemen and firemen, the men longest in the service, and who have by their good conduct, by strict attention to business, in our judgment become reliable and competent men. The Trainmaster, as a rule, nominates for promotion conductors from brakemen. The Master Mechanic nominates firemen to be promoted to engineers. We keep a record of all brakemen, firemen, conductors and engineers, from the time they enter the service until they leave it. In the promotion of men to positions of conductors and engineers, the Trainmaster and Master Mechanic consult with me, and we review the history, in consultation, both personal and professional, of each candidate for promotion. If there is nothing objectionable, the candidate is sent to the Trainmaster for thorough examination in the schedule or time-table. In this examination the Trainmaster puts them in every conceivable position on trains on the road, and ascertains what they would do under such and such circumstances. It has been the general expression of opinion among railroad employés that they can far easier run a train on the road than pass through this examination. They are questioned on every point that could possibly arise in the management of a train or engine. After passing examination satisfactorily the Trainmaster then calls their attention to the fact that, above all, we require safety, and that in cases of doubt that they must always take the side of safety. We have a printed rule in our schedule that also tells them in case of doubt, to always take the side of safety. After the candidate has passed the examination satisfactorily before the Trainmaster, he is then sent to me. I then ask him if there is any point in the schedule or about the running of the trains or engine that is not perfectly clear to him. I also tell him that he must consider the responsibilities of the position he is about to assume; the lives of hundreds and thousands of people and property amounting to hundreds of thousands of dollars are in his control. I then review the various railroad accidents that have occurred on the various roads in the country, the causes of which I endeavor to keep thoroughly informed upon, and recite these causes and their effect to him, showing him how each and every one of them might have been avoided if possible. In calling his attention to these accidents I say to him that the fundamental principle of our management is safety, and that I don't wish him under any circumstances to take any chances under the idea that he might lose his position; that I would never discharge him for delaying a train when he might cause a delay under the idea that he was not certain that he was right, but in all cases of doubt, no matter under what circumstances they might arise, he must stop his train and not move until he is positively sure he is right, and to not hesitate about asking for instructions or information in any such cases, and not to proceed until he got correct information from myself or the Trainmaster. In calling his attention to the various accidents and phases in railroad management, I show him that accidents have occurred in almost every way and shape the human mind could err in, and that those cases are experience to him of which he must take advantage in order that he may not fall into the same errors. I finally ask him if there is anything now, after his examination, that he don't understand fully; if any question or doubt as to the movement of train or engine has entered his mind, I wish to explain it to him before he assumes the position of conductor or engineer. The answer is usually, "There is not." If a conductor, I give written order to Trainmaster to run a train; if an engineer, I give order to Master Mechanic for an engine, and then say to him that if at any time under any circumstances any question of management of trains or engines on the railroad on which his position may have any bearing should arise, it is his duty to come to the Trainmaster, or myself, and get a correct explanation of the same, and it will always afford either of us pleasure to give it, remembering at all times that we want no accidents.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings will be held as follows:

Eastern, special meeting, in Tremont Temple, Boston, Sept. 30, at 11 a. m. The meeting is called to vote on the question of authorizing new leases of lines out of the State; also to act on proposed amendments to the leases of the Eastern in New Hampshire and the Portsmouth, Great Falls & Conway.

Kansas Pacific, meeting of Denver Extension bondholders, in New York, Sept. 30, to consider a plan for the purchase of the road.

Dividends.

Dividends have been declared as follows:

Atlantic & Pacific Telegraph, 0¾ per cent., quarterly, payable Sept. 30. This is the first dividend ever made.

Delaware Western, 1 per cent. This is the first dividend; the stock of the present company represents the bonds of the original Wilmington & Western.

Railroad Conventions.

The *Railroad Conductors' Association of the United States and Canada* will hold its twelfth annual convention at the Windsor Hotel, Montreal, Canada, beginning on Wednesday, Oct. 9.

The *General Time Convention* will hold its fall session at the Grand Pacific Hotel, Chicago, Oct. 10.

The *Railroad Claim Agents' Association* will meet at the Planters' Hotel, St. Louis, Oct. 15.

The *Southern Time Convention* will hold its fall session at the Windsor Hotel, New York City, Oct. 17.

The annual convention of the *Brotherhood of Locomotive Engineers* will be held in Indianapolis, beginning Oct. 16.

The *Narrow-Gauge Convention* will meet, pursuant to adjournment, in Cincinnati, Oct. 23.

The next regular meeting of the *American Institute of Mining Engineers* will be held at Lake George about the first of October next.

Foreclosure Sales.

The sale of the *Montclair & Greenwood Lake* road has again been postponed, from Sept. 14 to Sept. 21.

The sale of the *Omaha & Northwestern* road has been postponed from Sept. 3 to Oct. 24, at the request of the bondholders.

The sale of the *Selma & Gulf* road, which was to have taken place Sept. 16, was postponed.

General Passenger and Ticket Agents' Association.

This Association met in regular semi-annual convention at the Grand Pacific Hotel in Chicago, Sept. 13. President S. F. Pierson presided, and Secretary Samuel Powell called the roll, the following members answering to their names: Allen, W. F., Bridgeton & Port Norris; Anderson, A., Jeffersonville, Madison & Indianapolis; Andrews, W. H., Lake Erie & Louisville; Atmore, C. P., Louisville & Nashville & Great Southern; Baldwin, H. P., Central of New Jersey; Boylston, S. C., Savannah & Charleston; Broadus, J. M., Washington City, Virginia Midland & Great Southern; Bronson, H. M., Cincinnati, Sandusky & Cleveland; Campbell, Reau, Montgomery & Eufaula; Carey, S. E., New Orleans & Mobile; Carpenter, W. A., Detroit, Lansing & Northern; Cary, J. W., Lake Shore & Michigan Southern; Charlton, James, Chicago & Alton; Clark, Ellis, North Pennsylvania; Cleapor, P. L., Northeastern (S. C.); Cobb, Geo. W., Mineral Point; Cole, L. M., Baltimore & Ohio; Connor, Geo. L., Old Colony Steamboat Co.; Cummings, S. W., Central Vermont; Dadmun, Geo. A., Philadelphia, Wilmington & Baltimore; Daniels, G. H., Chicago & Pacific; Danley, W. L. Nashville, Chattanooga & St. Louis; Davant, J. S., Port Royal; Davant, T. S., Memphis & Charleston; Dawes, A. C., Kansas City, St. Joseph & Council Bluffs; DePew, H. S., St. Louis, Alton & Terre Haute; Drane, H. M., Macon & Brunswick; Durfee, W. M., Providence & Worcester; Edgar, Wm., Great Western of Canada; Egan, John, Indianapolis, Cincinnati & Lafayette; Ettinger, M. L., Chicago & Iowa; Farmer, L. P., Pennsylvania; Filkins, L. W., Stonington Steamship Line; Fitch, Chas. L., Mobile & Ohio; Flanders, D. J., Boston & Maine; Follett, Chas. E., St. Louis, Vandalia & Terre Haute; Ford, E. A., St. Louis, Iron Mountain & Southern; Foye, Charles H., Portland & Ogdensburg; Hall, J. Morton, Allegheny Valley; Heakes, F., Evansville & Terre Haute; Hooper, S. K., Fort Wayne, Jackson & Saginaw; Houston, W. J., Atlanta & Charlotte Air Line; Howard, Conway R., Chesapeake & Ohio; Hunt, J. S., Evansville, Terre Haute & Chicago; Johnson, W. P., Illinois Central; Kellogg, J. L., Davenport & Northwestern; Kendall, A. C., New York & New England; Kimball, Thos. L., Union Pacific; Kingsbury, C. E., Wabash, Chester & Western; Kingsbury, J. A., Marietta, Pittsburgh & Cleveland; Knight, Ray, Selma, Rome & Dalton; Leet, A. B., Grand Rapids & Indiana; Leve, Gustave, Georgia & Florida Steamship Co., and Savannah, Nassau & Havana Steamship Co.; Lord, C. K., St. Louis, Kansas City & Northern; Lyman, B., Cincinnati, Lafayette & Chicago Railroad; Macabe, Chas., Peoria, Pekin & Jacksonville; Macmurdo, J. R., Richmond & Danville; Manning, S. W., Boston, Barre & Gardner; Mass, John W., St. Louis & Southeastern; Matthias, B. F., Paris & Danville; Mayo, S. E., People's Line Steamers; Miller, F. A., Cairo & Vincennes; Mills, B. F., Burlington, Cedar Rapids & Northern; Murray, O. G., Galveston, Houston & Henderson; Myers, F. R., Pittsburgh, Fort Wayne & Chicago (Pennsylvania Company); Nourse, J. P., Flint & Pere Marquette; O'Brien, W. L., Pittsburgh, Cincinnati & St. Louis; Orme, A. J., Atlanta & West Point; Page, J. H., International & Great Northern; Parker, S. S., Louisville, Cincinnati & Lexington; Pierce, T. W., Jr., Galveston, Harrisburg & San Antonio; Penfield, T., Hannibal & St. Joseph; Pierson, S. F., Painesville & Youngstown; Pope, A., Charlotte, Columbia & Augusta and Wilmington, Columbia & Augusta; Powell, Samuel, Chicago, Pekin & Southwestern; Richardson, L. S., Ogdensburg & Lake Champlain; St. John, E., Chicago, Rock Island & Pacific; Sanburn, G. G., Northern Pacific; Shattuc, W. B., Atlantic & Great Western; Smith, E. H., Central of Georgia; Snow, F. E., Canada Southern; Spaulding, C. F., New London Northern; Stennett, W. H., Winona & St. Peter; Taylor, James L., Atlantic & Gulf; Thrall, W. A., Chicago & Northwestern; Thompson, R. W., Jr., Texas & Pacific; Townsend, H. C., Toledo, Peoria & Warsaw and Wabash; Tuttle, Lucius, Hartford, Providence & Fishkill; Wentworth, H. C., Michigan Central; White, W. F., Atchison, Topeka & Santa Fe; Wishart, I., St. Louis & San Francisco; Wrenn, B. W., Western & Atlantic; Zimmerman, D. M., Camden & Atlantic.

FRIDAY'S SESSION.

The following new members signed the roll: W. H. Dixon, St. Paul & Sioux City; F. H. Forbes, New Bedford & New York Steamship Co.; James A. Lyon, Keokuk Northern Line Packet Co.; James Barker, Wisconsin Central; W. S. Alexander, St. Paul & Pacific; Robert F. Nathan, Green Bay & Minnesota; M. Ewan, Sheboygan & Fond du Lac; J. F. Liscomb, Portland Steam Packet Co.; A. J. Smith, Cleveland, Columbus, Cincinnati & Indianapolis; George E. Merchant, Dakota Southern; B. F. Lewis, Chicago & Paducah; C. R. Van Benthuysen, New York & Albany Day Line; H. R. Meeker, St. Louis, Keokuk & Northwestern; H. D. Alden, Southeastern, of Canada; James R. Wood, Chicago, Burlington & Quincy; G. W. Smith, Lafayette, Muncie & Bloomington and Lafayette, Bloomington & Mississippi; P. A. Hewitt, Cleveland, Tuscarawas Valley & Wheeling; Edward A. Ray, New Haven & Northampton; R. G. Rombaur, Missouri & Western; F. E. Ford, Missouri Pacific; P. B. Groat, Kansas Pacific; Ben F. Patrick, Eastern.

On motion, a recess was taken and the Association proceeded in a body to pay its respects to President Hayes, who was in the hotel. In a few words the President expressed himself gratified to meet the members of the Association. He referred to the enormous increase and importance of railroads in the country, and paid a very handsome compliment to the passenger departments of the roads for carrying such multitudes to and from Philadelphia during the Centennial year with scarcely a life lost or an accident worthy of note. Afterward the several gentlemen shook hands with the President.

After the recess Mr. A. B. Leet was elected a member of the Executive Committee, and Mr. W. B. Shattuc was chosen to deliver the address at the next meeting.

The President having stated that both himself and the Secretary had changed to different roads since the last meeting, a resolution was adopted providing that a member changing road between one meeting and another should not cause a vacancy in an office held by that member, provided credentials from the new road are presented at the next meeting.

Several invitations were then received and referred.

At the afternoon session the address was read by Mr. C. P. Atmore, of the Louisville & Great Southern. It is published in full on another page. New York was then chosen as the place for the spring meeting; and an amendment to the constitution was adopted, providing that the semi-annual meetings shall be held at New York, Chicago, St. Louis, Cincinnati or Louisville.

The Committee on Coupon Tickets requested further time, as they were examining and comparing a large number of forms.

Under unfinished business, the subject of amount of baggage to be carried free with each passenger was presented. Mr. Myers offered this resolution: "That each first-class passenger be allowed to carry 150 pounds of baggage free." After extended discussion the resolution was lost by a large majority, and it was voted that 100 pounds should be rigorously adhered to. The convention adjourned until the next day.

SATURDAY'S SESSION.

At the meeting on the following day several resolutions were submitted and laid on the table. One was to the effect that the lines east of the Mississippi River should be allowed to check 100 pounds of baggage free on each emigrant's or colonist's ticket, and that the lines west of the river should be privileged to check 200 pounds. Another wanted the rule which was adopted on Friday, allowing 100 pounds of baggage to a certain class of passengers to be extended to all classes and that no special permits should be issued or commissions granted in any case. A third read that on each emigrant ticket 200 pounds of baggage may be checked to destination, if desired, over roads west of the Mississippi River, but lines east of the river shall collect from the passenger for any excess over 100 pounds. The next resolution was to the effect that 200 pounds of baggage may be checked free on all emigrant business to points west of the Mississippi River, and that regular rates should be charged for all in excess of that weight. The subject of commissions came up for consideration, and a resolution upon the matter submitted. It read: "That the members of this Association assembled hereby pledge ourselves to give the movement for the abolition of all commissions our earnest and hearty support, and that we will do all in our power to aid our managers in eradicating the evil." This resolution was also tabled.

Mr. H. C. Wentworth submitted the following, which was referred to the lines in interest for settlement:

"*Resolved*, That from and after Oct. 1, 1877, all lines east of Chicago, St. Louis, Fort Wayne, Indianapolis, Cincinnati, Columbus, Louisville, Chattanooga and Atlanta hereby withdraw from sale all round-trip, interior, immigrant and special tickets of every kind, and from that time insist upon the sale of first and second-class tickets at regular tariff rates over their respective lines."

A formal communication was read by the Secretary, from the Northwestern Traveling Men's Association, asking certain concessions to members of that organization in the matter of passenger fares. The Association instructed the Secretary to inform the traveling men aforesaid that they must negotiate locally with each road for any arrangement looking to reduced fares.

At the close of the proceedings about $200 were collected for the yellow-fever sufferers. The meeting then adjourned until Monday Sept. 16.

MONDAY'S SESSION.

At the session on Monday, Sept. 16, the committee appointed at the previous meeting to solicit funds for the yellow-fever sufferers was authorized to disburse the money collected by them as they may deem proper.

An amendment to the constitution was offered that no one who is not a member of the Association shall be eligible to any office longer than he continues a member thereof; but a change from one railway to another during vacation shall not affect the official standing of any member who is properly accredited. After a short discussion the matter was laid over.

A resolution was adopted that, inasmuch as the rules hitherto adopted regarding the collections for excess of baggage have been thus far of only partial application, owing to the various necessities of the different systems of the roads in the country, and to bring about a more satisfactory working, the following exceptions will be permitted to be made: From all points east of the Mississippi River, 200 pounds of baggage may be checked on each emigrant ticket to any point west thereof, and that the rules governing first and second-class tickets apply to emigrant tickets up to any point on the Mississippi River. The excess on emigrant tickets to any point on the Mississippi River over the amount allowed on first and second-class tickets shall be charged 15 per cent. of emigrant rates per 100 pounds to the nearest point on the river.

A motion to appoint a stenographer to make a full report of the proceedings was lost. Resolutions of respect to the memory of Dr. Isaac J. Welch, a recently deceased member, were passed.

Several amendments to the constitution were proposed, but were not adopted.

The Convention then resolved itself into a Committee of the Whole, with Mr. E. St. John in the chair, to discuss the question of rates.

A question was raised regarding the advisability of discontinuing the present rate-sheet, and in its place establish district rate-sheets. It was proposed to form District Associations, as follows: East, West, Southwest, Southeast and Central.

After a lengthy discussion it was resolved that the present rate-sheet in use by the Association be abolished, and that a committee of twenty-five, to be made up of members from the different sections, be appointed by the Chair to devise a plan for territorial rate-sheets and report to the meeting at 3 p. m.

Upon reassembling the Committee recommended a reconsideration of the vote to abolish the present rate-sheet, which was done.

They also recommended that the present schedule of rates be published as usual, and that the territorial rate-sheets as at present in vogue be published as may be deemed most advisable by the General Ticket Agents at competitive centres, and that territorial associations be formed to settle local differences.

A motion prevailed that the schedule of rates be continued in force until the spring meeting in New York.

A resolution was also adopted that a committee of twenty be appointed by the Association to consider what changes of organization, if any, are necessary to render it of greater permanent value to the passenger and transportation interests of the United States and Canada, and that said committee report at the next regular meeting of the Association.

It was resolved that the General Baggage Agents of the roads, members of this Association, be instructed to use as great care as possible in promptly forwarding all checks that may be sent to them or the baggage agents of the roads for distribution to connecting roads, and that all checks delivered to them shall be way-billed, so that, if not properly delivered, they can be traced in the same way as estray baggage is traced.

After passing the usual resolution of thanks, the Association then adjourned. Many of the members joined in an excursion to Elgin and Geneva Lake over the Chicago & Northwestern, while others went to St. Paul on invitation of the Chicago, Milwaukee & St. Paul.

In the evening the representatives of the roads in Ohio, Indiana, Illinois, Minnesota and Wisconsin held a meeting at the Grand Pacific Hotel last evening, and decided to form the Central Division General Ticket and Passenger Agents' Association. A meeting will be held in Chicago on Oct. 9 to perfect the organization. This is in accordance with the resolution passed by the Association.

Traveling Passenger & Advertising Agents' Association.

The sixth annual convention met in Cincinnati, Sept. 4, about 50 members being present. President Reed delivered his address, in which he referred to their precarious tenure of office under recent arrangements. The members were then welcomed to the city and a number of invitations presented.

After electing officers, a Committee on General Purposes was appointed and an adjournment had until the next day.

On the following day a number of resolutions looking to the protection of advertising matter were adopted. A committee was appointed to revise the constitution. A number of minor matters of interest to the Association were then considered. After some discussion Philadelphia was selected as the place for the next convention.

Resolutions of respect to two deceased members were passed and a committee appointed to raise funds for monuments to them. A collection was taken up for the yellow-fever sufferers.

Mr. Joseph True was chosen to deliver the next annual address. After appointing a committee of arrangements and passing the usual resolutions of thanks, etc., the Associa- adjourned.

ELECTIONS AND APPOINTMENTS.

Boston, Hoosac Tunnel & Western.—In the list of directors published in our number for Sept. 6, the name of Mr. S. S. Guthrie, of Buffalo, was omitted. In the list of officers the name of Hon. Fred. L. Ames was omitted from the Executive Committee.

Colorado Springs & Manitou.—The officers of this new company are: B. F. Crowell, President; A. V. Hunter, Secretary; Irving Herbert, Treasurer. Offices at Colorado Springs, Col.

Denver & South Park Construction & Land Co.—At the recent annual meeting of this company, which is building the Denver, South Park & Pacific road, in Denver, Col., the following directors were chosen: Wm. Barth, J. S. Brown, W. S. Cheeseman, A. B. Daniels, John Evans, C. B. Kountze, D. H. Moffatt, Jr., John W. Smith, George Tritch. The board elected John W. Smith, President; George Tritch, Vice-President; L. H. Eicholtz, Secretary; D. H. Moffatt, Jr., Treasurer.

Indianapolis, Bloomington & Western.—At the annual meeting of the stockholders in Urbana, Ill., Sept. 11, the following directors were chosen: Henry Conkling, William Y. McCord, L. J. Bond, Daniel Gardner, William H. Smith, S. H. Busey, C. W. Smith, George Nebeker, A. P. Lewis, B. E. Smith, F. Collins, C. R. Griggs, I. T. Thomas. The board elected B. E. Smith President; C. R. Griggs, Vice-President; A. P. Lewis, Secretary and Treasurer.

Jersey City & Albany.—This company has been organized by the bondholders who bought the old Jersey City & Albany road at foreclosure sale last year with the following directors: Charles Siedler, J. F. Mallory, Delos E. Culver, Jersey City, N. J.; John McGregor, Newark, N. J.; G. A. Hobart, Paterson, N. J.; Conrad N. Jordan, Teaneck, N. J.; F. A. Potts, Flemington, N. J.; John W. Molson, Rockland, N. Y.; Henry R. Low, Pittsburgh, Pa.; S. E. Olmstead, Norwalk, Conn.; G. B. Newton, Wm. B. Scott, C. R. Conger, New York. The board elected Charles Siedler President.

Pittsburgh Southern.—The new board has elected Joseph Kammerer, Vice-President; M. K. Salisbury, Secretary and Treasurer; A. C. Hays, Superintendent.

Pullman Palace Car Co.—At the annual meeting in Chicago, Sept. 12, the old board was reëlected, as follows: John Crerar, Marshall Field, A. T. Hall, Charles G. Hammond, George M. Pullman, Chicago; J. N. DuBarry, Philadelphia; J. Pierpont Morgan, New York. The board subsequently elected George M. Pullman, President and General Manager; Charles G. Hammond, Assistant President; Horace Porter, Vice-President; Amos T. Hall, Vice-President *pro tem.*; A. S. Weinsheimer, Secretary. The only change is the choice of Mr. Weinsheimer, late cashier, to the position vacated by the defaulter Angell.

Sioux City & Pembina.—At the annual meeting in Sioux City, Ia., Sept. 16, the following directors were chosen: C. G. Wicker, J. H. P. Allison, T. J. Stone, A. W. Hubbard, C. H. Longman, S. T. Davis, G. E. Merchant. The board elected officers as follows: President, C. G. Wicker; Secretary, A. W Hubbard; Treasurer, C. H. Longman; Superintendent, George E. Merchant. The road is controlled and worked by the Dakota Southern

Toledo, Ann Arbor & Northeastern.—This company was organized at Ann Arbor, Mich., Sept. 16, by the election of the following directors: James M. Ashley, Henry C. Waldron, Edwin Lawrence, Edwin Treadwell, James M. Ashley, Jr., Philip Bach, James B. Gott. The board elected James M. Ashley, President; Henry C. Waldron, Secretary and Attorney; James B. Gott, Treasurer.

Traveling Passenger & Advertising Agents' Association.—At the annual convention in Cincinnati, Sept. 4, the following officers were chosen: President, J. G. Everest, Chicago, Milwaukee & St. Paul; Vice-Presidents, John Ludman, Lake Shore & Michigan Southern; Wm. M. Shaw, Indianapolis, Bloomington & Western; Wm. H. True, Lake Shore & Michigan Southern; M. Humphrey, Toledo, Peoria & Warsaw, and J. M. Kelley, Indianapolis, Cincinnati & Lafayette; Secretary, W. P. Cooley.

Wheeling & Lake Erie.—The Court of Common Pleas of Stark County, O., has appointed Charles H. Jenkins Receiver, on application of some of the creditors.

PERSONAL.

—Prof. David M. Greene, for the past four years Deputy State Engineer and Surveyor of the State of New York, has been appointed Director of the Rennselaer Polytechnic Institute, of Troy, N. Y., the oldest engineering school in the country. Prof. Greene was Professor of Geodesy and Road Engineering in the same school from 1855 to 1860, was at one time in the navy as Professor of Steam Engineering in the Naval Academy, and since 1869 has been engaged in the practice of his profession.

—The Republicans of the Sixth New Jersey District have nominated for Congress Mr. Cortland Parker, a prominent lawyer, who is a director of the New York, Lake Erie & Western and was a director of the old company for several years. Mr. Parker, however, declined to run.

—The New Hampshire Democrats have nominated for Railroad Commissioners Hadley P. Fowler, of Bristol, David H. Young, of Manchester, and E. A. Peterson, of Greenland. Their candidate for Governor, Frank A. McKean, is a director and Treasurer of the Nashua & Rochester Company.

—Mr. Charles Hamilton has resigned his position as Superintendent of the Springfield & Northwestern road, to which he was recently appointed.

—President T. W. Peirce, of the Galveston, Harrisburg & San Antonio, sailed recently for England. It is said that his business there is to obtain money for the extension of the road to El Paso.

—Among recent bankrupts is E. K. Alburtis, a New York merchant and formerly President of the Ridgefield Park, afterward the Jersey City & Albany Railroad Company. His liabilities are chiefly as endorser for that company, and amount to $172,000.

—Mr. Robert J. Dickson died at his residence in Buffalo, N. Y., Sept. 11, aged 35 years. He was born in Buffalo and educated as a civil engineer. His first work was on the Lake Shore road and he was afterward employed on the survey of Oswego Harbor, in Government employ. In 1872 and 1873 he was employed on the Canada Southern, which he left to enter the office of the City Engineer of Buffalo, where he remained until last winter, when he was placed in charge of part of the work on the Olean, Bradford & Warren road.

—Mr. R. Miles, Division Freight and Passenger Agent on the Chicago, Burlington & Quincy, died in Quincy, Ill., Sept. 6, aged 40 years. Originally from Dover, N. H., he had been in the employ of the Chicago, Burlington & Quincy a number of years, and had held his late position two years.

—The Republicans of the Louisville District in Kentucky have nominated for Congress Col. Horace Scott, General Superintendent of the Jeffersonville, Madison & Indianapolis road. It is supposed that Colonel Scott has very slight chances of election, the district being overwhelmingly Democratic.

—The Massachusetts Republicans have nominated for Governor, Ex-Gov. Thomas Talbot, of Billerica, for many years a director of the Boston & Lowell, and President of the company since the death of the late Francis B. Crowninshield.

—Mr. S. F. Pierson, General Passenger Agent of the Painesville & Youngstown, and late of the Cleveland, Columbus, Cincinnati & Indianapolis, and President of the General Passenger & Ticket Agents' Association, has just been presented with a magnificent Dent chronometer, valued at $450, by a few of his friends from Cleveland, Cincinnati, Indianapolis and St. Louis. The elegant time-piece bears the following inscription: "S. F. Pierson, from his Associates in the Railway Service, August, 1878."

TRAFFIC AND EARNINGS.

Railroad Earnings.

Earnings for various periods are reported as follows:

	1878.	1877.	Inc. or Dec.	P. c.
Eight months ending Aug. 31:				
At., Topeka & Santa Fe	$2,305,577	$1,479,385	I. $826,192	55.8
Cairo & St. Louis	142,402	156,058	D. 13,656	8.6
Clev., Mt. Vernon & Delaware	243,179	244,514	D. 1,335	0.5
Gt. Western of Can.	2,951,816	2,701,080	I. 250,736	9.3
Int. & Gt. Northern	795,967	866,927	D. 70,960	8.2
St. L., Alton & T. H., Belleville Line	300,364	317,135	D. 16,771	5-3
Seven months ending July 31:				
At., Miss. & Ohio	$889,251	$889,522	D. $271	....
Net earnings	224,316	216,648	I. 7,678	3.5
Bur. & Mo. River in Nebraska	814 769	483,675	I. 331,094	68.5
Net earnings	468,552	250,653	I. 217,899	86.9
Chicago & Alton	2,437,369	2,337,670	I. 99,699	4.3
Net earnings	974,937	930,712	I. 44,225	4.8
Chi., Bur. & Quincy	7,364,218	6,301,348	I. 1,062,870	16.9
Net earnings	3,038,615	2,546,047	I. 492,568	19.3
Clev., Mt. Vernon & Delaware	208,766	210,525	D. 1,759	0.8
Net earnings	27,636	32,546	D. 4,910	15.0
Dakota Southern	122,924	96,486	I. 26,438	27.4
Net earnings	56,871	.....	.....	....
Int. & Gt. Northern	677,506	750,988	D. 83,482	11.1
Net earnings	157,999	112,977	I. 45,022	39.8
Kansas Pacific	1,762,015	1,620,407	I. 141,608	8.7
Net earnings	528,312	641,588	D. 113,276	17.7
Missouri, Kansas & Texas	1,475,686	1,684,058	D. 208,372	12.4
Net earnings	189,107	611,538	D. 422,431	69.1
Paducah & Memphis	115,527	101,887	I. 13,640	13.4
Net earnings	23,398	28,842	D. 5,444	18.8
St. Louis, Iron Mt. & Southern	2,178,368	2,209,461	D. 41,083	1.9
Net earnings	786,788	923,729	D. 136,941	15.0
St. Paul & Sioux City	332,833	248,337	I. 84,496	34.0
Net earnings	124,409	58,241	I. 64,168	110.2
Sioux City & St. Paul	207,284	134,576	I. 72,708	54.0
Net earnings	54,865	13,287	I. 41,578	312.6
Southern Minnesota	427,184	254,804	I. 172,380	67.7
Net earnings	237,009	60,029	I. 176,980	294.9
Union Pacific	6,764,808	7,026,000	D. 261,192	3.7
Net earnings	3,775,630	4,013,773	D. 238,146	5.9
Wabash	2,569,425	2,347,877	I. 221,548	9.4
Net earnings	582,974	434,053	I. 148,921	34.3
Six months ending June 30:				
Grand Rapids & Indiana	$574,500	$517,367	I. $57,133	11.0
Net earnings	76,913	152,690	D. 75,777	49.6
Month of June:				
N. Y., Lake Erie & Western	$1,258,990	$1,232,163	I. $26,827	2.2
Net earnings	486,310	256,258	I. 230,052	89.8
Month of July:				
Bur. & Mo. River in Nebraska	$79,688	$68,340	I. $11,348	16.6
Union Pacific	1,014,959	1,033,592	D. 18,633	1.8
Month of August:				
Atchison, Topeka & S. F	$467,000	$255,572	I. $211,428	82.7
Cairo & St. Louis	20,686	17,176	I. 3,510	20.4
Cleve., Mt. Vernon & Del	34,413	33,989	I. 424	1.2
Denver & Rio Gr'de.	119,719	84,572	I. 35,147	41.5
Int. & Gt. Northern	118,461	115,939	I. 2,522	2.2
St. L., Alton & T. H., Belleville Line	43,655	46,503	D. 2,848	6.1
St. L. & S. E., St. Louis Div	66,377	61,226	I. 5,151	8.4
St. L. & S. E., Ken. Div	34,877	34,172	I. 705	2.1
St. L. & S. E., Tenn. Div	15,055	17,304	D. 2,249	1.30
First week in September:				
Chi. & Eastern Ill.	$17,313	$15,333	I. $1,980	12.4
St. Louis, Iron Mt. & Southern	88,400	99,028	D. 11,228	11.3
Week ending Sept. 6:				
Gt. Western, of Can.	$91,569	$88,493	I. $3,076	3.5
Week ending Sept. 7:				
Grand Trunk	$189,239	$200,202	D. $10,963	5.5

Coal Movement.

Anthracite tonnage for the week ending Sept. 7 was: 1878, 163,444; 1877, 337,303; decrease, 173,859 tons, or 51.5 per cent. From present indications the anthracite production will continue to show a decrease for some time.

The coal tonnage of the Pennsylvania Railroad for the eight months ending Aug. 31 was as follows:

	1878.	1877.	Inc. or Dec.	P. c.
Anthracite	423,630	385,856	I. 37,774	9.8
Semi-bituminous	1,027,044	1,053,210	D. 26,166	2.5
Bituminous	993,319	934,306	I. 59,013	6.3
Coke	687,962	503,241	I. 184,721	36.7
Total	3,131,955	2,876,613	I. 255,342	8 9

At the monthly meeting of the Anthracite Board of Control, at Long Branch, Sept. 17, it was resolved, after some discussion, to fix the October production at 1,200,000 tons. It was also agreed to extend the present combination until April 1, 1879.

A "coal-boat rise" in the Ohio River last week took out from Pittsburgh in two days 45 tows, carrying in all 233,680 tons of coal, chiefly bound for Cincinnati and Louisville.

Coal shipments from Seattle, Wash. Ter., for August were 15,030 tons. For the eight months ending Aug. 31, they were: 1878, 77,286; 1877, 81,254; decrease, 3,968 tons, or 4.9 per cent. The August shipments were the largest ever made in one month.

Grain Movement.

Receipts of grain of all kinds, in bushels, at the eight Northwestern markets for the week ending Sept. 7 have been, for six years:

1878.	1877.	1876.	1875.	1874.	1873.
8,462,587	5,015,253	4,240,764	3,747,319	3,105,478	6,810,373

The receipts this year are 69 per cent. greater than last year and 24 per cent. greater than for the corresponding week in 1873, when they were the greatest up to this year. But they are less than the receipts of either of the two previous weeks this year.

The shipments of the same market for the same week were:

1878.	1877.	1876.	1875.	1874.	1873.
6,605,490	4,596,604	4,192,884	3,829,607	3,441.377	6,082,202

The shipments this year are a little less than those of the previous week, but are larger than for any other week this year.

Of the above shipments the quantities and percentages of the total shipped by rail were:

1878.	1877.	1876.	1875.	1874.	1873.
1,316,419	903,998	1,808,411	1,498,529	323,919	881,902
19.9 p.c.	21.6 p. c.	43.1 p. c.	39.2 p. c.	9.1 p. c.	12.8 p. c.

The rail shipments this year have been exceeded nine times since navigation opened, but not since the present rate of 30 cents per 100 lbs. from Chicago to New York went into effect.

The receipts at the seven Atlantic ports for the same week were:

1878.	1877.	1876.	1875.	1874.	1873.
6,846,950	4,745,601	3,612,266	3,313,691	2,329,662	4,363,702

The receipts this year are a little less than for the preceding week, but greater than in any other week but one in the history of the trade. Of these Atlantic receipts this year, 49.3 per cent. arrived at New York, 19.6 at Baltimore, 12.6 at Philadelphia, 8.7 at Montreal, 7.2 at Boston, 2.5 at New Orleans and 0.1 per cent. at Portland.

Curiously enough, Baltimore's receipts, which recently were nearly all wheat, for this last week are not one-sixth wheat, but more than four-fifths corn.

Wheat in the last week formed 43½ per cent. of the Northwestern receipts, 47½ of the Northwestern shipments, and nearly 60 per cent. of the Atlantic receipts. Corn was 34 per cent. of the Northwestern receipts, 36⅓ per cent. of the Northwestern shipments and only 27½ per cent. of the Atlantic receipts.

Grain exports from the seven Atlantic ports for the eight weeks ending Sept. 12 compare as follows for 1878 and 1877:

1878.	1877.	Increase.	P. c.
35,798,017	16,183,248	19,614,769	121.2

The exports in 1877, however, were very large.

Receipts and shipments at Chicago and Milwaukee for the week ending Sept. 16 were:

	Receipts.	Shipments.
Chicago	3,376,657	3,517,499
Milwaukee	555,025	415,125

For the same week receipts and shipments at Buffalo by rail and water were:

	Receipts.	Shipments.
By rail	719,300	1,538,840
By water	3,325,250	2,027,493
Total	4,044,550	3,566,333

Receipts at four Atlantic ports for the same week were:

New York	4,458,078	Philadelphia	965,200
Baltimore	916,159	Boston	440,110

Philadelphia receipts exceed Baltimore receipts for the first time for nine weeks, but after the opening of navigation and until July Philadelphia receipts were generally the largest. Baltimore receipts are again chiefly (89 per cent.) wheat.

Of the receipts at New York 36 per cent., amounting to 1,617,940 bushels, were by rail. The canal receipts and the total receipts were much the largest of the year and were exceeded but once last year.

San Francisco wheat exports for the two months of the California crop year, ending Aug. 31, were: 1878, 2,707,835 bushels; 1877, 483,460 bushels; increase, 2,224,375 bushels, or 460.1 per cent.

Adjusting Fast-Freight Line Differences.

A dispatch from New York to the Chicago *Tribune* says: "The directors of the Erie & North Shore Dispatch Company are to meet in this city Tuesday to adjust the differences between the Canadian railroads over which the transportation line is operated. It is stated that the trouble arises from a demand by the Canada Southern for a larger percentage of business, which the Grand Trunk and Great Western roads resist. The latter road claims that, by reason of recent loss of traffic from the Blue Line, which was reduced from 85 to 95 per cent. by Thomas A. Scott, as arbitrator, its percentage should be increased. The present percentages are: Great Western, 50 per cent.; Canada Southern, 30 per cent.; Grand Trunk, 20 per cent. It was stated on Saturday that there had been a disposition in some quarters for some time to abolish the Erie & North Shore Dispatch Company, Mr. Vanderbilt favoring the consolidation of the fast-freight business so as to have only two or three fast-freight lines. This was resisted by Mr. Jewett, it is said, and the settlement of the question was deferred until the return of Commissioner Fink from Europe."

THE SCRAP HEAP.

Railroad Manufactures.

The North Chicago Rolling Mill Co. has contracted to furnish steel rails enough to lay 100 miles of track for the new extensions of the Atchison, Topeka & Santa Fe.

John Stephenson & Co., of New York, are building the cars for a street railroad from Calais to St. Pierre, France.

The Ohio Nut and Bolt Co., at Cleveland, O., is running its works full time and reports business good.

Clish, Crow & Co., of Truro, N. B., manufacture the Starratt adjustable frog, and are making a number for the Intercolonial. The frog is made of rails locked into a bed-plate without bolts or nuts, and it is claimed for it that it can be repaired without taking it up, by the insertion of new pieces, and that it is not spoiled if one of the pieces is broken.

Waldorf Furnace, at Ironton, W. Va., has gone into blast, after lying idle four years. It has lately been sold to Charles S. Hurd, of New York.

It is said that the rolling mill at Canal Dover, O., has been sold to Mr. Jacob Reese, of Pittsburgh, who will shortly start it up.

Jones & Co., of Pittsburgh, are building a 15,000-barrel oil tank at Emlenton, Pa.

The schedule in bankruptcy of Kimberly, Carnes & Co., of Sharon, Pa., shows liabilities of $785,530, of which $57,289 are secured claims. The assets are valued at $280,353.

The Baltimore Car Wheel Co., has its foundry busy on orders for home and foreign roads.

The Railway Speed Recorder Co., of Kent, O., is putting speed recorders in the freight cabooses of the Chicago & Eastern Illinois and the Missouri, Kansas & Texas.

It is said that R. G. Huston & Co. have contracted with the Edgar Thomson Steel Works for the rails required to complete the Cincinnati Southern at $47 per ton.

The Baldwin Locomotive Works, at Philadelphia, recently shipped three heavy engines to Australia and some small engines for plantation roads in Cuba. Work has been begun on some heavy passenger engines for the Atlantic, Mississippi & Ohio.

The Pittsburgh Locomotive Works have made twice as many stationary engines and locomotives thus far this year as in any corresponding period since the panic: namely, 22 of the latter and about 50 of the former, 20 of the locomotives being for the Pittsburgh & Lake Erie Railroad, one for the Pittsburgh Southern and the other for the North Wisconsin. The majority of the stationary engines, which vary from 15 to 250 horse-power, were for the oil region. The Pittsburgh & Lake Erie engines all have phosphor-bronze bearings and balanced valves.

The National Tube Works Co. has begun to build a new rolling mill at its works in McKeesport, Pa.

Charlotte Furnace, at Scottsdale, Pa., has gone into blast, after a rest of several months

Bridge Notes.

The Niagara Bridge Works, at Buffalo, N. Y., are running full time on orders and report good prospects for fall and winter work.

J. N. Drury, bridge-builder, at Richmond, Ind., is repairing the roof of the Union passenger depot at Columbus, O., by putting in eight trusses to each arch. There are 22 arches in the roof, which, owing to the great weight of the roof, are beginning to buckle, and the trusses are put in to support them.

Notes.

It is generally supposed that a city like New York will find business for all the railroads that can be built to it; but within a radius of 20 miles from the City Hall we can count three railroads which have track laid upon them, but are not now worked, and there is more than one old unused road-bed in the same district.

A big freshet, like that of last week, teaches many lessons of insufficient water-ways and choked culverts, but the lesson is not heeded in more than one case out of a hundred, and the bank is filled in, to be washed away the next big storm. Every year we read of the greatest storm ever known, but really the same thing has happened times before, and will hereafter.

Standard-gauge advocates had better give up their dry arguments; the narrow-gauge has "dropped into poetry." At a recent excursion over the first section of a new road the company was carried to the end of the track and kept there while the Superintendent recited an original poem in praise of the narrow gauge. We have not seen the whole poem, but if the stanzas we have read are a fair specimen, every man and woman on the excursion must have gone home a confirmed opponent of anything less than the six feet gauge.

The ambition of the more juvenile commuter on a suburban road is to ride in the baggage car. He may have to stand up or sit on a sharp-edged trunk and have his toes mashed by express boxes, but if he can get in the baggage car he is satisfied, and a seat in the baggage-master's chair makes him perfectly happy.

A Narrow Escape.

This narrow escape is told in the *Burlington Hawkeye*: "Engine No. 226 got loose last evening and moved off on her own hook to back out of the yard, and was passing the lower round house with 75 pounds of steam, when F. W. Macholtz, fireman of 120, climbed her pilot, and stopped her in time to save her from going over the bridge, which was open. The engine was going on the backward motion, and was backing a baggage car and a coach."

Tramps.

The American tramp has evidently determined to go into winter quarters. Trains on the Delaware Division of the Erie were boarded by large numbers of this element on Saturday night. They were forced from two eastward-bound freight trains, and at Cochecton took possession of a car loaded with grain attached to conductor Hogan's train. An investigation showed that a party of thirteen had taken up quarters in the car, and they were with difficulty compelled to leave the same. The same party got on conductor Bodle's train, but were likewise forced off. They are said to be very rough and surly fellows.—*Port Jervis Gazette, Sept.* 17.

Aid for the Yellow-Fever Sufferers.

The following letter appears in the Cincinnati *Gazette* of Sept. 10:

"*To the Editor of the Cincinnati Gazette:*

"DEAR SIR: Inclosed I hand you a check for $401.15, a contribution from the Little Miami Railroad employés for the relief of railroad men and their families suffering from yellow-fever in the Southern cities. According to the terms of the subscription this money is to be forwarded through the Cincinnati *Gazette* office to the Howard Association for distribution. Will you please return their receipt for the same to me, and oblige. Yours, respectfully, J. H. SETCHEL, Master Mechanic."

And the *Gazette* comments as follows:

"The *Gazette* received yesterday from the Little Miami Railroad employés $401.15 for the relief of railroad men and their families suffering from yellow fever in the Southern cities. The instruction for distribution is precisely given in the letter inclosing this handsome gift, which we print in another column. The business mind can readily conceive the situation in which railroad men in the South are placed by the stoppage of business by the yellow-fever terror. And the business mind can readily conceive the generous and paternal spirit of the workmen of the Little Miami, who made this handsome gift out of their wages. The 'Old Reliable' is true to her old name all through."

The Stevens Brake.

The Baltimore *Gazette* of Sept. 18 says: "United States Commissioner Rogers, sitting as a master in chancery in the United States Circuit Court for the District of Maryland, heard yesterday a portion of the case of Ashahel Ernigh vs. the Baltimore & Ohio Railroad and the other companies in the Eastern Railroad Association. The action is brought to recover for the use of the patent belonging to the plaintiff, known as the Stevens brake, which has been in use for the past thirteen years, and for damages to the patentee. The master in chancery is to ascertain the amount. The case is one of an interesting character to those concerned in patent questions. The plantiff is represented by George Harding, of Philadelphia; A. H. Walker, of Chicago, and Bernard Carter, of Baltimore. Mr. John H. B. Latrobe appeared for the Eastern Railway Association. Mr. Walker opened the case for the complainant, and was followed by Mr. Latrobe. He did not conclude his argument yesterday, but will resume this morning."

Steam Street Cars.

A separate steam motor from the Baldwin Locomotive Works has been placed on the Hamilton & Dundas street railroad, and more are expected. The road runs from the city of Hamilton, Ont., to the suburban village of Dundas, and is to be entirely worked by steam.

Under a Sleeping Car.

On the arrival of the 1:50 New York express train of the Great Western Railway here recently, the men engaged in testing the car wheels and running gear of the cars were surprised to see a man stowed away upon the trucks of one of the sleeping cars—a position in which it is as much as any one's life is worth to ride even the shortest distance. The policeman in charge of the station was informed of the circumstance, and at once arrested and searched the man, finding only six cents in money and some papers on his person. On being questioned the man said his name was Lenox, and that he had been working in Emmet, where he had received a telegram informing him that his wife was lying at the point of death in Buffalo. Monday morning he left Emmett, paying his fare to London, beyond which point his money ran out. Being determined to reach Buffalo somehow, and not knowing of any means of doing the journey so quickly except by rail, he stowed himself away on the truck under the car, and there he had remained until discovered at Hamilton. Let the reader, if it is possible, form a conception—the faintest idea—of the perils of such a journey, and then it may be possible to understand what the poor grief-stricken German must have suffered. The distance between London and Hamilton, by the Great Western Railway, is 85¼ miles, and the slightest change of position on Lenox's part, or the least obstruction on the track, would have launched the poor fellow into eternity at once. And then think of the agony he must have suffered from the dust, sand and *débris* thrown up by the swiftly-flying train, and the great tension on the nerves and sinews by being compelled to maintain his hold on the truck. The policeman said he would not risk a journey of one hundred yards in the position Lenox was for the whole Great Western Railway; and where is there another who would do so for what is commonly called "mere love?"—*Hamilton (Ont.) Spectator.*

OLD AND NEW ROADS.

Atchison, Topeka & Santa Fe.—The track on the New Mexico extension of this road is now laid to Trinidad, Col., 83 miles from the junction with the main line at La Junta. Work is being pushed on the extension from Trinidad, south by east to Las Vegas, N. M., 133 miles further, the company expecting to reach that point by next April. This section of 50 miles will carry the road over the Raton Mountains and will require some difficult and expensive work. A force is already at work on the Raton Tunnel, but the road will not wait for its completion, but will be carried over the mountain by a temporary line, which will have grades as high as 300 feet to the mile.

The company has offered to build a branch from Florence, Kan., northwest by way of Marion Centre to McPherson, about miles, 40 provided the counties through which the branch will pass, will grade bridge and tie the line.

Baltimore & Hanover.—The track is now laid for two miles from the junction with the Bachman Valley road at Black Rock, Md. Most of the grading is done to the junction with the Western Maryland near Reisterstown; seven bridges are in place, and a construction train is at work.

Boston & Lowell.—The Boston *Advertiser* of Sept. 17 says: "The terms of the proposed lease of the Nashua & Lowell to the Boston & Lowell road, 6½ per cent. on a capital stock of $800,000 for 99 years—which has been agreed upon by committees of the directors of the two roads, will be acted upon by meetings of the stockholders of these corporations, to be called within a few days. The lease has been drawn, and it is generally believed that it will be ratified by the stockholders. For the past 20 years the two roads have been run together on a mutual contract—the Boston & Lowell road to receive 69 per cent. of the earnings and pay 69 per cent. of the losses, and the Nashua & Lowell road to receive 31 per cent. of the earnings and pay 31 per cent. of the losses. The leases held by the Nashua & Lowell road, including one of the Stony Brook road, running about 12 years, are included in the new lease proposed. The stockholders of the Boston & Lowell road hold a majority of the stock of the Salem & Lowell and Lowell & Lawrence roads. The lease of the first-named road to the Boston & Lowell road expires Oct. 1, but it will probably be renewed. * *

"The negotiation for leasing the Nashua & Lowell Railroad to the Boston & Lowell Railroad Company for a term of ninety-nine years, has been enjoined until the 8th day of October next by Judge Clark, of the Circuit Court of the United States in New Hampshire. We understand that the ground of this injunction, in part, at least, is that the terms of the contract of lease required the Nashua & Lowell Railroad Company to cancel an old claim amounting to some $200,000 in favor of the Nashua & Lowell Railroad Company against the Boston & Lowell Railroad Company, and that some of the stockholders were not willing to consent to this."

Brattleboro & White Hall.—The bids received for the construction of this road have been under consideration, but the award of the contract will not be made until the next meeting of the board, which will be held Sept. 23.

Central Branch, Union Pacific.—At a meeting held in New York, Sept. 17, holders of about $600,000 bonds were present and unanimously agreed to a proposition made by the company that they should take lands in exchange for their over-due coupons. The first default was made in November, 1874, and the unpaid coupons now amount to about $571,000.

Central Pacific.—A force of 600 Chinamen has been at work some time grading the extension of the Northern Railroad (owned by this company) from the old terminus at Williams, Cal., northward up the west side of the Sacrament Valley to Willows, a distance of 23 miles. The grading is now nearly finished and track is laid to Funk's Slough, 18 miles from Williams, and 57 miles from the junction with the California Pacific at Woodland. Trains are expected to run to Willows early in October.

Charleston, Mount Pleasant & Sullivan's Island.—It is proposed to build a railroad from Charleston, S. C., by way of Mount Pleasant to Sullivan's Island and across the island to the beach on its ocean side. It is thought that it will have a large excursion business in the summer and will serve a large truck-farming district.

Columbia River Portage.—This company has been organized in Oregon to build railroads around the rapids of the Columbia River, at the Cascades and the Dalles on the Oregon side of the river. The object is to secure independent portage roads at those points, the present lines being owned by the Oregon Steam Navigation Company.

Columbus, Washington & Cincinnati.—The Ohio Court of Common Pleas has granted a petition of the incorporators for the appointment of a receiver, and has chosen for that position Mr. J. E. Gimperling, who is also Receiver of the Dayton & Southeastern. This company was originally the Waynesville, Port William & Jeffersonville, and has 18 miles of completed road of 3 feet gauge from Glenwood, O., to Allentown Junction, on the Dayton & Southeastern. It leases the use of that road from the junction to Washington Court House, 11 miles. It has, we believe, no funded debt, but a considerable floating debt.

Delaware & Maryland Ship Canal.—At the last session of Congress an appropriation of $15,000 was made for the survey of a route for a ship canal to connect Baltimore with the ocean. Major Hotten, United States Engineer, has organized two corps of engineers, who are now actively engaged in making a survey of the different routes which appear available for the purposes of a ship canal. Several routes have been proposed and will receive the consideration of the engineers. One is by making the Choptank River, which enters the Chesapeake Bay below Cambridge, about fifty miles from Baltimore, a part of the proposed canal as far as Indian Creek, from there running directly across to the northwest fork of the Nanticoke, and then in a direct line to Broadkiln Creek, about three miles above the Breakwater. This route is estimated to be about 40 miles across. By another route it is proposed to strike the St. Michael River, which is about 40 miles from Baltimore, at Royal Oak, and from there go to the Choptank River, to a point above Lord's Landing, and then to Cabin Creek, from which the line will be run directly across to Broadkiln Creek on the Delaware Bay. A third route proposed is from the Sassafras River, which is about 35 miles from Baltimore, across to Deep Water Point, making use of the Blackbird Creek, the distance across which is about 30 miles. The most direct route seems to be the Chester River route, which runs from Baltimore to Queenstown, 28 miles, and then directly to Broadkiln Creek on the Breakwater, a distance of 55 miles. This is the longest land route, but it makes the most direct line, and is considered the most desirable. It is claimed that a canal, by connecting the Chesapeake and Delaware bays, will shorten the distance from Baltimore to the ocean about 200 miles, and that the foreign commerce of Baltimore, and also of New York and Philadelphia, will be greatly benefited thereby. The Maryland Legislature, at its last session, authorized the city of Baltimore to aid the canal to the extent of $500,000, and, should Congress make a further appropriation, it is expected that the completion of the canal will be an early event.

Denver & Rio Grande.—The Union Contract Company has been advertising for bids for grading the extension of the Cañon City Branch from Cañon City, Col., west to the mouth of the South Arkansas, 66 miles; also for 170,000 ties. Bids for the grading were received up to Sept. 16; for the ties to Oct. 1. This extension will be alongside of the Atchison, Topeka & Santa Fe's branch to Leadville.

The Denver *Tribune* reports that the company has negotiated in New York a loan sufficient in amount to clear off the floating debt, and, with the earnings of the road, to meet the November interest on the bonds.

Emlenton, Shippenville & Clarion.—The Pittsburgh *Telegraph* of Sept. 13 says: "There has been a difficulty for some time between the oil producers of the Clarion district and the United Pipe Lines relative to the transportation of the oil of that district, and some little time ago an arrangement was made by the producers there to run their oil over the Emlenton & Shippenville road to its junction with the Allegheny Valley road. The Emlenton & Shippenville agreed to carry the oil for ten cents per barrel, just one-half the charge of the United Pipe Lines. After making this arrangement a delegation of producers called upon Col. Thomas A. Scott to ascertain if the oil would be permitted to pass over the Pennsylvania road, and were answered in the negative. A suit will probably be brought to compel the road to receive the freight."

Gulf, Colorado & Santa Fe.—The Galveston County Court has resolved to vote the county stock in favor of ratifying the contract made for the sale of the company's bonds in London. This secures the adoption of the contract.

At a meeting held in Galveston it was resolved to appoint a canvassing committee of citizens to secure subscriptions in the city for the $200,000 bonds which must be taken in Texas, according to the terms of the contract.

Jamesville & Washington.—This company has established a steamboat line from the terminus of the road at Jamesville, N. C., on the Roanoke, through Albemarle Sound and the Chowan and Blackwater rivers to Franklin, Va., where the boat connects with the Seaboard & Roanoke Railroad.

Jersey City & Albany.—The bondholders, who bought this road at foreclosure sale more than a year ago, have organized a new company, and will at once make arrangements to put the road in repair and operate it. No regular trains have been run over it for nearly two years. It is completed from the New Jersey Midland at Ridgefield Park, N. J., north to Tappantown, N. Y., 12 miles, and is nearly all graded to Haverstraw on the Hudson River, some 12 miles further.

Kankakee & Southwestern.—The work on this road is now progressing very fast, and track is laid from the junction with the Illinois Central at Otto, Ill., westward eight miles. The grading is done for some miles beyond and the fencing has nearly reached the end of the track.

Knoxville & Emory Gap.—Arrangements are being made for the organization of a company to build a railroad from Knoxville, Tenn., westward about 35 miles, to connect with the Cincinnati Southern at Emory Gap.

Lake Apopka & Clay Springs.—This company has been organized to build a narrow-gauge road from Lake Apopka, Fla., east by north to Clay Springs on the St. Johns River, about 25 miles.

Lawrenceville Branch.—It is proposed to build a rail-

road from Lawrenceville, in Gwinnett County, Ga., northwest to Suwannee on the Atlanta & Charlotte Air Line. The distance is about 12 miles.

Little Rock & Fort Smith.—It is said that this company has decided to build a bridge over the Arkansas River from its present terminus at Van Buren, on the north side of the river, to Fort Smith. The river there is wide, shallow, and has a treacherous bottom.

Marietta & North Georgia.—Track is now laid from Marietta, Ga., northward 10 miles, and a construction train is at work. The company hopes to reach Canton, 20 miles, before the end of the month.

Memphis, Kansas & Colorado.—Track is reported laid and trains running on the section of this narrow-gauge road from Cherokee, Kan., on the Missouri River, Fort Scott & Gulf road, westward to Parsons on the Missouri, Kansas & Texas, about 25 miles. This section of the road passes over large coal-beds, and a considerable business in coal is already reported. The road has been built by Green, Bennett & Co., contractors, Col. L. S. Hamilton being Superintendent of Construction.

Milwaukee, Lake Shore & Western.—A dispatch from Madison, Wis., says the Wisconsin Supreme Court has decided to grant a writ of *quo warranto* against this company. The company will be required to show cause why it does not comply with the law and keep its general offices, with its books and records, within the State.

Montclair & Greenwood Lake.—Before the Chancellor of New Jersey, Sept. 14, argument was heard on the intervening petition of certain second-mortgage bondholders. The Chancellor granted an order admitting the petitioners as parties to the foreclosure proceedings, with leave to contest the right of certain persons to hold the first-mortgage bonds obtained by hypothecation and sale, and the Receiver was directed to allow an examination of the books, so as to learn what had become of the $700,000 first-construction bonds authorized at the reorganization in December, 1875. This order will not prevent the sale of the road.

It is said that holders of five-sevenths of the first and a majority of the second-mortgage bondholders have assented to the plan of reoganization.

Montreal, Portland & Boston.—This road is to be operated hereafter by the Passumpsic Company, which now holds an undisputed controlling interest in the stock. Negotiations are pending for an arrangement by which its trains will run over the Grand Trunk from St. Lambert, P. Q., to Montreal.

Mystic Valley.—It is said that this road, originally projected as a narrow-gauge line from Boston to Medford and Woburn, will be built as a standard-gauge road from the Boston & Maine in Somerville, Mass., to a point on the same company's Lowell Branch in Wilmington.

New York Elevated.—A statement has been published by this company showing its present condition. It has now the West Side Line from the Battery to Sixty-first street on Ninth avenue and the East Side Line from the Battery to Sixty-seventh street on Third avenue, and contracts are out for the extension of both lines. There is a sufficient equipment and more has been ordered to meet the needs of the extensions as they are completed. The capital account is as follows:

	Amount authorized.	Amount issued.
Stock	$5,000,000	$4,252,600
Bonds	7,000,000	6,325,000
Total	$12,000,000	$10,577,600

There is no floating debt, and the condition of the treasury on Aug. 17 was as follows:

Cash in bank	$221,756
Cash in office	19,786
In Central Trust Co., at call, bearing interest	100,000
In United States Trust Co., at call, bearing interest	50,000
Total	$391,542

The number of paying passengers carried since January, 1872, for the years ending with Sept. 30 has been as follows:

1872, nine months	137,446
1872–73	643,275½
1873–74	796,072½
1874–75	920,571
1875–76	2,012,953½
1876–77	3,011,862½
1877–78, ten months	3,204,820
Total	10,727,001

The earnings and expenses for the same years were as follows:

	Earnings.	Expenses.	Net earnings.	P. c. of Exps.
1872, nine months	$13,744	$13,243	$501	96.35
1872–73	64,602	61,758	2,844	95.60
1873–74	81,047	80,487	560	99.31
1874–75	93,631	88,372	5,259	94.38
1875–76	202,675	188,177	14,498	92.85
1876–77	303,208	189,553	113,655	62.52

Interest paid for 1876–77 was $99,995, leaving a surplus of $13,660. The great increase of earnings last year was made with a trifling increase of expenses.

The East Side Line on which trains have been running as far as Forty-second street on Third avenue, has been opened for travel to Sixty-seventh street.

New York & New England.—A dispatch from Boston, Sept. 18, says: "The syndicate which was formed some months since for the purpose of raising $3,000,000 to redeem the mortgage bonds of the Hartford, Providence & Fishkill Railroad, has transferred the amount to the New York & New England Railroad. It is understood that all parties to the contract are now agreed, and that no opposition will be presented to the final adjustment of this long-vexed question."

New York, Lake Erie & Western.—A commission appointed by the English Master of the Rolls is now sitting in New York to take testimony in the suits pending in London between the company, the London Banking Association, Bischoffsheim & Goldsmith and James McHenry.

Ohio & Mississippi.—Several parties are now in the field, asking for proxies from stockholders and voting bondholders for the approaching annual meeting. Apparently there will be quite a lively contest.

A bill has been filed in the United States Circuit Court in Springfield, Ill., by Frederick P. Dimpfel, of Baltimore, Md., a stockholder of the company, against the company and others, praying for a decree of the Court to amend and cancel the purchase of the Springfield Division, and to declare void the bonds issued for said purchase, of which the Farmers' Loan & Trust Company, of New York, is the trustee. Mr. Dimpfel has always opposed the purchase of the Springfield Division (the old Springfield & Illinois Southeastern road), and now charges that it is the chief cause of the present embarrassments of the company

Oil Transportation.—Complaint under oath has been made to Gen. William McCandless, Secretary of Internal Affairs of Pennsylvania, by prominent oil men in the oil regions, charging the Pennsylvania, New York Central & Hudson River, Lake Shore & Michigan Southern, New York, Lake Erie & Western, Pittsburgh, Titusville & Buffalo and Allegheny Valley Railroads, and the Acme and Standard Oil Company and the Pipe Lines, with transcending their corporate privileges in discriminating in freights, etc., and asking the Secretary to take official action in the premises. The Secretary has accordingly detailed Mr. James Atwell as his duly authorized deputy to investigate the charges. Mr. Atwell was to begin the investigation at Titusville, Pa., Sept. 19, and a number of witnesses have been subpœnaed.

Parker & Karns City.—It is said that an extension is to be built from Butler, Pa., down the Conoquenessing Creek to Harmony, to connect with the Pittsburgh, New Castle & Lake Erie road, now under construction.

Profile & Franconia Notch.—The surveys for this projected road in the White Mountains are nearly finished. The total rise from the Boston, Concord & Montreal at Bethlehem, N. H., to Echo Lake is 760 feet, and the last three miles to Echo Lake will have a grade of 116 feet to the mile.

Quebec, Montreal, Ottawa & Occidental.—The Quebec Government still remains in possession of this road, but Contractor McDonald is prosecuting his claims actively. Meantime the whole case is involved in such a cloud of actions, cross-actions, motions and attachments for contempt, that it is impossible for anyone not familiar with the intricacies of Quebec law to follow it or to know just how the parties stand.

St. Joseph & Des Moines.—Work has for some time been in progress on the Missouri section of this narrow-gauge road, and track is reported laid for 10 miles northeast from St. Joseph, Mo. A construction train has been put upon the road.

Seattle & Walla Walla.—A contract has been let to J. H. Page for an extension from the wharf at Seattle, Wash. Ter., to the timber at the head of the bay. Work has also been begun on a section of ten miles of the extension from Renton eastward toward the mountains.

Shenandoah Valley.—Efforts are being made to secure the building of a branch from this road near Charlestown, W. Va., to connect with the Western Maryland. A considerable amount has already been subscribed to the project and a survey of the proposed line is to be made.

South Carolina.—Judge Bond having recovered from his sickness, argument on the motion to appoint a receiver was resumed Sept. 13, and continued four days.

The arguments in the case were closed Sept. 18, and Judge Bond at once gave his decision. He held that the company was bankrupt, having a bonded debt of nearly $6,000,000, while it had been obliged to pledge all its available assets to secure a loan of $200,000. The floating debt was $2,000,000 and was being rapidly reduced to judgments under which the property would be seized piece-meal and the working of the road embarrassed. The appointment of a receiver was necessary for the protection of the bondholders. The complainants in the suit had a right to control it, and it was too late for the trustees to intervene after postponing so long the performance of their duty. He would therefore grant the order for a receiver, and said in conclusion:

"So far as the injunction is concerned which the complainants pray for in their bill, I shall issue it, with the modification that it apply only to the second mortgage bonds of the railroad received by the defendants as collateral security for debts of the company, which bonds have been received directly from the company or its officers."

Messrs. Richard Lathers, Bentley D. Hasell and John H. Fisher, of New York, and Wm. J. Magrath, President of the company, were suggested by counsel. The Judge said that he would announce the appointment hereafter, but would not select any officer of the company.

The hearing as to the Greenville & Columbia road was postponed to the regular December term of the Court.

Springville & Sardinia.—Track on this road is now laid from the junction with the Buffalo, New York & Philadelphia (which is two miles north of Arcade, N. Y.) westward 2½ miles to the village of Sardinia, and the grading is done to Richmond Gulf, six miles further. A construction train is on the track and the rails will be laid as fast as the bridges and trestle-work can be put up. The whole length of the road, which is of 3 ft. gauge, from the junction to Springville, is 11 miles.

The Great Storm.—An extremely severe and widespread storm of wind and rain prevailed on Sept. 11, 12 and 13, extending from North Carolina to Lake Erie and even across the lake into Canada. It was more or less felt along the Atlantic Coast, but its chief force was in West Virginia, Western Pennsylvania and Ohio, though the James River also felt the effects of the heavy rains about its head-waters. The damage done was very large and a number of accidents to trains are reported, with serious loss of life. Some bridges on the James River were lost, but the line of the Chesapeake & Ohio along the New and Kanawha rivers felt the storm more, and several lost bridges and washed-out banks are reported, with at least one wreck. Northward of this the Baltimore & Ohio was badly damaged, parts of its line through West Virginia being under water for days, and some bridges destroyed. The Cleveland & Pittsburgh, the Pittsburgh, Wheeling & Kentucky and the Pittsburgh, Cincinnati & St. Louis suffered from wash-outs and lost bridges, followed by several days' suspension of traffic. The Pittsburgh, Fort Wayne & Chicago also suffered badly in the same way.

The greatest force of the storm, however, seems to have been concentrated in the Shenango and Mahoning valleys, where railroad travel was absolutely stopped for a week, and the loss must have been very great. On the Erie & Pittsburgh road bridges and banks disappeared, numerous culverts were destroyed, and there were several wrecks with serious loss of life. The Lake Shore suffered considerably, especially on its Franklin Branch. The Atlantic & Great Western was under water from Meadville to Kent and from Youngstown to Sharon; some important bridges were lost, and wrecks and loss of life are reported there also. The Mahoning Division is not yet fully opened. The Painesville & Youngstown is closed and will not be opened for some days yet, and the Ashtabula, Youngstown & Pittsburgh was also badly damaged. Some damage, but less severe, is reported in the Tuscarawas and Hocking Valleys, and there was local trouble around Pittsburgh. Erie, Pa., was isolated by the flood for several days. Across the lake in Canada, also, the Great Western and Northern roads were blocked several days by wash-outs.

The damage done to railroads by the storm is estimated variously, some reports putting it at $500,000, without counting loss and inconvenience from stoppage of traffic. It is hardly possible, however, to make a close estimate, but the loss is undoubtedly very great. Altogether the great September storm of 1878 will long be remembered as one of the most disastrous on record.

Toledo, Ann Arbor & Northeastern.—This company has been organized to build a railroad from Ann Arbor, Mich., northeast about 33 miles to Pontiac, to connect there with the extension of the Michigan Air Line now under construction. The capital stock is to be $500,000. Nearly all the officers are connected with the Toledo & Ann Arbor.

United Pipe Lines.—The *quo warranto* suit against this company came up at Franklin, Pa., Sept 11, but the counsel for the company were not prepared to file an answer and asked for delay. This was objected to, but the Court finally granted a rule requiring an answer to be filed within 20 days.

Wheeling & Lake Erie.—On application of some of the creditors last week the Court of Common Pleas of Stark County, O., granted an order for the appointment of a receiver, and selected Charles H. Jenkins for the position. The property was at once surrendered to him. The company has only about 15 miles of completed road between Norwalk and Huron, O., and some grading done at other points. It has been embarrassed for a long time, and an application for the dissolution of the company is pending.

Wisconsin Central.—It is said that this company has offered to build a branch from Medina, Wis., to Oshkosh, provided a bonus of $100,000 can be secured. Medina is 11 miles west of Menasha, and the distance thence south by east to Oshkosh is about 11 miles.

Woodstock.—The long controversy between this company and the Central Vermont as to the extension of the Woodstock track to a connection with the Northern road at White River Junction, Vt., has been ended by an amicable agreement. The extension is to be built, the Central Vermont directing where the crossing of its track is to be made.

ANNUAL REPORTS.

Pullman Palace Car Company.

The following statements are from the report of President George M. Pullman for the year ending July 31, as presented at the annual meeting in Chicago last week.

The financial statement is as follows:

ASSETS:		
Cost of 460 cars, equipments and franchises		$8,491,252.92
Car-works at Detroit, cost		344,883.54
Patents, United States and foreign, cost		164,383.43
Furniture and fixtures in offices, 52 in number		63,165.18
Real estate in Chicago		22,001.66
Amount invested in car associations, controlled and operated		2,392,937.69
Materials and supplies, including cars in course of construction		294,208.40
Balance of accounts and bills receivable and payable		346,007.91
Cash on hand and in bank		94,294.64
Total assets		$12,213,165.37
LIABILITIES:		
Capital stock issued, 59,382 shares		$5,938,200.00
Currency debenture bonds, 8 per cent.	$1,546,000	
Currency debenture bonds, 7 per cent., due Oct. 15, 1878	603,000	
Sterling convertible debenture bonds, 7 per cent	218,000	
		2,367,000.00
Amount received from sale of old cars leased from Central Transportation Co		419,013.68
Guarantee fund account, to provide for taxes in dispute and possible losses in adjustment of old accounts		15,728.55
Sinking fund account, to represent possible depreciation in franchises and patents, including loss on cars sold and replaced		600,000.00
Balance at credit of income account		2,873,223.14
Total liabilities		$12,213,165.37

The surplus accounts are invested in assets of the company. The funded debt is unchanged in amount; the interest charge thereon is $181,150, or $394 per car per year on the 460 cars reported.

The income account is as follows:

	1877–78.	1876–77.	Decrease.	P c.
Earnings (leased lines included)	$1,709,136	$2,035,671	$326,535	16.0
Proportion of earnings of other sleeping-car associations controlled and operated	443,194	526,468	83,274	15.8
Patent royalties	8,500	8,500	.....	....
Total	$2,160,830	$2,570,639	$409,809	15.9
Working expenses, including legal expenses, taxes and insurance (leased lines included)	577,745	617,518	39,773	6.4
Maintenance of upholstery and bedding	150,188	177,561	27,373	15.4
Proportion of working and maintenance expenses on controlled lines	150,645	189,993	39,348	21.7
Total	$878,578	$985,072	$106,494	10.8
Net earnings	$1,282,252	$1,585,567	$303,315	19.1
Rentals of leased lines	264,000	264,000	.....	....
Profit and loss, including interest, discount and exchange	16,716	46,206	29,490	63.8
Total charges	$280,716	$310,206	$29,490	9.5
Profits applicable to capital	$1,001,536	$1,275,361	$273,825	21.5

The disposition of this balance of profit for the year was as follows:

Balance of profits		$1,001,535.77
Interest on bonds	$181,150	
Dividends, 8 per cent	471,056	
		652,206.00
Surplus		$349,329.77
Balance of account rebuilding and remodeling old cars	$13,179.06	
Surplus carried to credit of income account	336,150.71	
		349,329.77

This surplus was equal to an additional 5⅞ per cent. on the stock. The President's report says: "In comparing the above earnings with those of the previous fiscal year, it should be remembered that the last five months of the Centennial year were included in the statement for the fiscal year ending July 31, 1877.

"The loss sustained by the company through its former Secretary is ascertained to be $115,000. Vigorous and comprehensive measures have been adopted to secure his apprehension; and it is to be hoped that a considerable sum may be recovered before the close of the present fiscal year—at which time the net loss will be deducted from the balance at credit of income account."

The President stated that during his recent visit to England, he had made arrangements with the Great Northern and the Northeastern companies for the running of Pullman cars on their lines.